Paper
TRADE JOURNAL

Dec. 28, 1951

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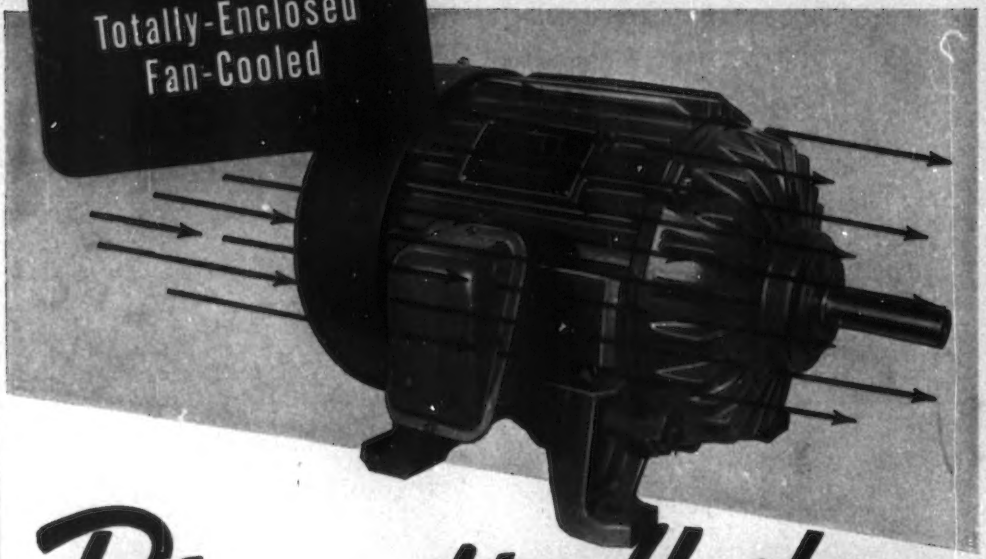
Season's Greetings

The poet has written: "Friendship is a sheltering tree"—indeed an appropriate text for the Holiday Season. Now at the close of one year and on the threshold of a new one, we renew our appreciative thanks for the heartening confidence of so many friends through so many years . . . and extend good wishes to all in the Pulp and Paper Industry for their well-being in 1952.

GOTTESMAN & COMPANY, Inc.



Blows itself clean as a Whistle!

DIRT IS CARRIED AWAY by cooling air blown over the ribbed cast iron frame and bearing housings of this new Allis-Chalmers tefc motor. That means less motor cleaning . . . inspection . . . overhaul!

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Studies show that on most applications, totally-enclosed fan-cooled motors more than pay back their extra cost in reduced maintenance. And this new Allis-Chalmers Type APZ tefc motor makes maintenance costs lower than ever before.

Rigid Construction

The frame is cast iron which has high resistance against corrosion and distortion. Bearings are pre-lubricated at the factory and should need no attention for years. Tapped holes with pipe plugs to permit regreasing and to provide grease relief are standard equipment.

Get All The Facts

The new Allis-Chalmers Type APZ totally-enclosed fan-cooled motor is built in all NEMA standard frame sizes from 224* to 505. Also in explosion-proof type. Your A-C Authorized Distributor or District Office has complete information. Call today, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B7225.

A-3427

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by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

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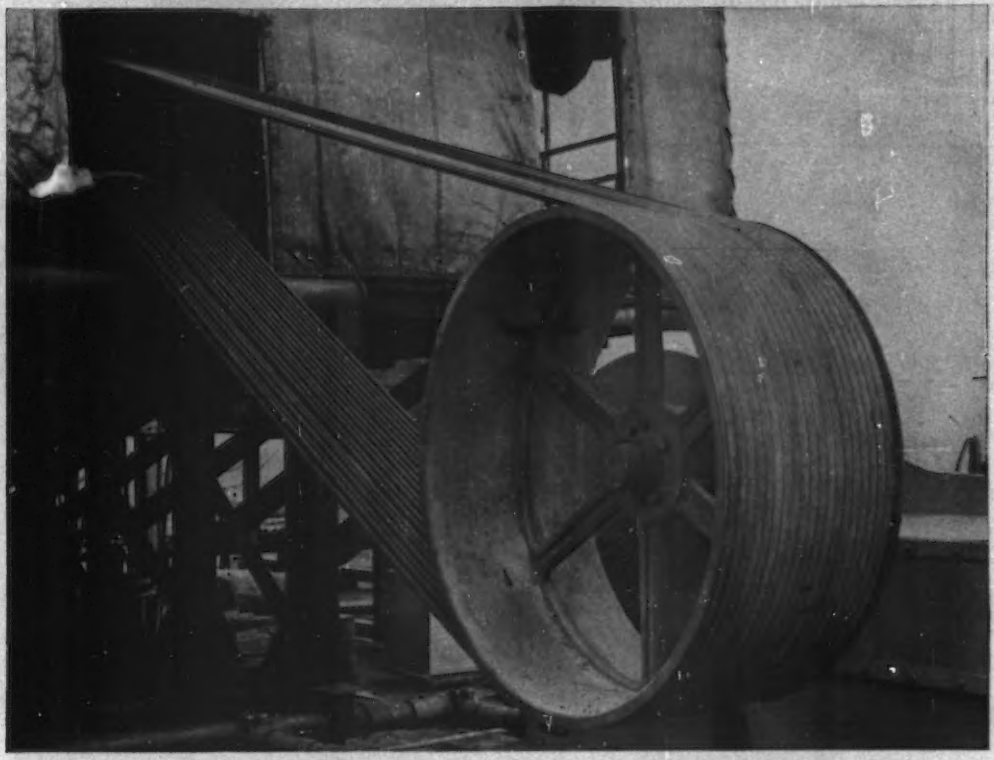
PUMPS — Integral motor and coupled types from ½ in. to 72 in. discharge and up.

Texrope and Vari-Pitch are Allis-Chalmers trademarks.

ALLIS-CHALMERS

*Similar design non-ventilated motors Type APK, also available in frames 203 to 224 inclusive.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Here B. F. Goodrich grommet belts are saving $104.50 a month

B. F. Goodrich grommet V belts cut costs 20 to 50%

THESE 18 V belts are needed to drive heavy pumps for drilling oil wells. The belts have to operate 24 hours a day, 7 days a week, in all sorts of weather. Ordinary belts couldn't stand the heavy pulling load, couldn't take the strain of round-the-clock operation. They averaged 9 months' life in this kind of service.

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Better grip, less slip — Because a grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich has the grommet!—No other multiple-V belt is a grommet V belt (U. S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

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This main acid plant control panel includes: acid storage temperature controller, combustion chamber temperature recorder, acid storage pressure recorder, sulfur burner level controller, SO_2 recorder, and sulfur melter temperature controller. Photo courtesy of Gould Paper Company, Lyons Falls, New York.

THE efficient operation of sulfite acid plants has become more important than ever . . . with sulfur in such short supply.

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MINNEAPOLIS
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ABC Paper TRADE JOURNAL ABP

VOL. 133 DECEMBER 28, 1951 No. 26

NEXT WEEK

A proposed plan to eliminate some major waste paper headaches. It is time to do it right now.

The use of soft X-rays as a tool in paper analysis.

HAPPY NEW YEAR

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REMEMBER THESE DATES

JAN. 14-17: Plant Maintenance Show and Conference, Convention Hall, Philadelphia, Pa.

JAN. 21: Chicago Section of the Technical Assn., of the Pulp and Paper Industry, Meeting, Chicago Bar Assn., Chicago, Ill.

JAN. 23-25: Annual meeting of the Canadian Pulp and Paper Ass'n, Mount Royal Hotel, Montreal, Que., Canada.

FEB. 19-22: American Pulp & Paper Assn. Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y. Starts on Tuesday this year. 75th Annual Dinner Thursday, Feb. 21.

FEB. 20: Salesmen's Assn. of the Paper Industry, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, N. Y.

FEB. 18-21: Technical Assn. of Pulp and Paper Industry, Annual Meeting, Commodore Hotel, New York, N. Y.

MARCH 16-18: American Institute of Chemical Engineers, Atlanta Biltmore Hotel, Atlanta, Ga.

MARCH 24-26: The National Paper Trade Assn., Annual Meeting, Waldorf-Astoria, New York, N. Y.

MAY 5-8: Third Coating Conference of the Technical Assn., of the Pulp and Paper Industry, at the Sherman Hotel, Chicago, Ill.

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NO BREAKDOWNS HAVE OCCURRED on these modern beaters since installation, six years ago, at this completely Sun-lubricated mill. From the very first day of operation, a Sun grease, specially compounded for this paper-mill use, has protected the bearings against the punishing effects of continuous heavy loads and intermittent shock-loading.

ONE OIL CHANGE A YEAR is all that is required for the nearly inaccessible gears of this pulper—thanks to a Sun gear lubricant. And no make-up is needed. The oil used previously deteriorated under the severe conditions it had to meet. Six oil changes a year were necessary, despite a make-up of 70 gallons.

IN THESE 4 BIG MILLS SUN LUBRICANTS KEEP STOCK PREPARATION COSTS LOW

COSTS OF TURBINE OIL HAVE BEEN CUT 25% since this mill changed to a Sunvis 900 Oil five years ago. Though higher in price than the lubricant it replaced, this Sun oil is more economical because of its longer service life. It has provided full protection; the turbines show no corrosion even after idle periods.

NO MORE BEARING FAILURES DUE TO LUBRICATION—not in the Jordans of this mill—since a Sun gear lubricant was put into use here about four years ago. With the former lubricant, failures averaged two a week. Bearing replacements and the time spent in repairs and maintenance cost the mill a substantial sum.

For complete information on Sun Paper Mill Lubricants, or for the services of a Sun representative, call the nearest Sun Office or write to Department PT-12.

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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, December 26, 1951.

Dubious as a Korean peace looks at press time, taut and explosive as are international relations, there is good reason for seeing in early 1952 a happier period for market pulp consumers than for some time past.

In other words, should conditions worsen — and no thinking adult can doubt that it could happen should the truce talks fail this week—the groundwork which has been laid is adequate to the immediate future of paper and board demand. Except for unbleached kraft paper—which will get some dip in the next quarter—stockpiles of papers and boards and products are abundant, consumer demand easing.

Should tensions ease and peace come, current industry output will be gradually eased to a "normal" operating-ratio of about 85 percent for papers, the figure at which board operation has been settling for some weeks, and at which U. S. pulp production operated during October, a drop of 11 percent from April's high of 97.7 percent.

Changes in Pulp Supply

Most notable change in pulp supply is the steadily expanding U. S. output which from April to October added 233,595 tons to available supply, and which by the close of 1952 will raise overall productive capacity to 18½ million tons.

To be sure, the major portion of these increases, whether in unbleached southern kraft or prime bleached kraft, is integrated with paper output and does not reach consuming mills. Should the market demand for papers recede as is generally expected, the tonnages of pulp not wanted for own use will become available for market pulp consumers.

Also a factor in market pulp supply is that in making themselves self-sufficient in pulp supply, the integrated mills thus withdraw from the world pulp market and release those tonnages for which they had been contracting. For example, the new output at Acme, N. C., now reported to be in trial runs of unbleached kraft, will eventually provide its co-owners, Riegel Paper Corp. and Howard Paper Co., with 200 daily tons of prime bleached kraft which hitherto had been purchased on the open market.

It is believed this expansion alone will react on the Scandinavian producers which now are able to send more pulp to this market than during the year 1951 when, it will be recalled, they cut back by 50 percent the contract tonnages because of higher prices available in world markets than those allowed by OPS ceilings.

TABLE I

WOODPULP: U. S. PRODUCTION, CONSUMPTION, INVENTORIES, OCTOBER, 1951

(Tons of 2,000 pounds)

Grade	U. S. Production Tons	U. S. Production % of Base	Consumption in paper & bd. manuf.	End of Month Inventories: At pulp mills(1)	At pulp mills(1) For later sale	At paper & bd. mills Oct. 1951(1)	At paper & bd. mills Sept. 1951
Total	1,461,938	86.6	1,557,261	102,382	31,048	489,651	496,564
Spec. Alpha & Dissolving	58,267	95.4	3,739	11,834	n.a.	12,906	13,150
Sulfite, Total	218,026	86.2	281,771	26,334	8,098	195,758	195,814
Blchd. Total			179,061	14,887	4,532	82,914	81,475
Unblchd.			102,710	11,447	3,566	112,844	114,339
Sulfate, Total	760,528	90.1	813,295	26,825	9,054	205,583	210,688
Blchd. Total			212,336	12,472	5,071	101,985	103,182
Unblchd.			572,132	13,982	3,983	95,261	100,683
Semi-blchd.			28,827	371		8,337	6,823
Soda	40,132	71.3	43,951	1,586	n.a.	14,091	14,153
Groundwood	214,372	81.7	243,354	31,477	n.a.	52,091	53,309
All Others	170,613	80.4	171,151	4,326	n.a.	9,222	9,450

Based on Bureau of Census Figures.
* Revised. (1) Preliminary. n.a.—Not available.

Japan to Buy More Pulp

Tokyo reports an about-face by Japanese chemical fiber producers for the year 1952. After a close study of domestic pulp production potential, the producers plan to import 50,000 tons, half of which will be bought from Canada, 10,000 tons from Norway, 8,000 from Finland, and 7,000 tons from Sweden.

Materials

Chlorine—By far the most critical in U. S. papermaking today is chlorine. Far outstepping the much-discussed sulfur, chlorine supply is a problem which confronts all mills having bleaching plants.

In short supply since the Korean crisis of June, 1950, the situation has been worsened by the decision of four major producers to convert to the more profitable chlorinated solvents used for anti-freeze solutions, insecticides, etc. Announcements of contract cancellations for 1952 left papermakers gasping for new supply.

No early improvement in the situation is seen. The mills are scouting for chlorine. In some instances, they are experimenting with sodium peroxide to extend their supply. However, at an l.c.l. price of 20c a pound, this product compares unfavorably with chlorine at 3c.

New facilities getting under way this month will add some 740 daily tons to national output. However, the production is either in captive plants which have no tankcars for distance shipment of any surplus or the new output is sold up.

NPA anticipates that a major part of the chlorine expansion program for which certificates of necessity aggregate over $200,000 will be completed during 1952, and make available some 1,800 daily tons. Within the industry this opinion is looked on as optimistic, though gradual expansion is due for 1952.

The most likely improvement in the chlorine situation is seen as lighter demand from paper mills during the early months of the year, as paper demand eases. Also a likelihood is less brightness in the finished product.

Rosin—Sizable German purchases of naval stores, and reports that other European countries are coming for supplies, have contributed to the strong outlook for the rosin market.

The new German order includes $150,000 of gum, and $280,000 of wood rosin. A Dutch order is also reported to be on the way, as well as some Italian orders. Should these orders materialize, it is felt that demand will well exceed the season's crop and will effect a market upturn from the $7.90 paid for K grade on December 21.

Support Level Set for 1952

Proper level named to encourage needed production of gum naval stores 1952 copy was announced by the Dept. of Agriculture at 90 percent of parity price of crude pine gum as of December 1, 1951.

The initial loan rate will be $7.48 per 100 pounds of gum rosin grading G or above; but individual rates may be revised from time to time as conditions justify, it was stated.

Corn Starch—Prices lifted 15c a 100 pounds for pearl and dextrines, reflecting the higher corn market. Pearl quoted at $6.34, bags, carlots, f.o.b. works; white dextrines at $7.73 carlots, works.

Casein—Market described as unsettled with demand for immediate needs only. Supplies are ample and prices unchanged. (See *Prices.*)

—E.P.N.

Paperboard Production (Tons)*

	Dec. 15 1951	Dec. 8 1951	Dec. 16 1950
Production	200,151	201,883	239,164
New Orders	169,359	265,609	204,724
Unfilled Orders	387,000	428,921	681,176
% of Activity	86	86	105

* Source: National Paperboard Assn.

"Aces High for Your Coating Operations"

♠ Contracoater—reverse roll coater—Model CC

♥ Applicator—for coating and laminating—Model C-66

♦ Coater-Laminator—gravure and offset coater-laminator—Model 4 CL

♣ Waxer—wet and dry waxer—Model 2W

Write for full details on above coater equipment

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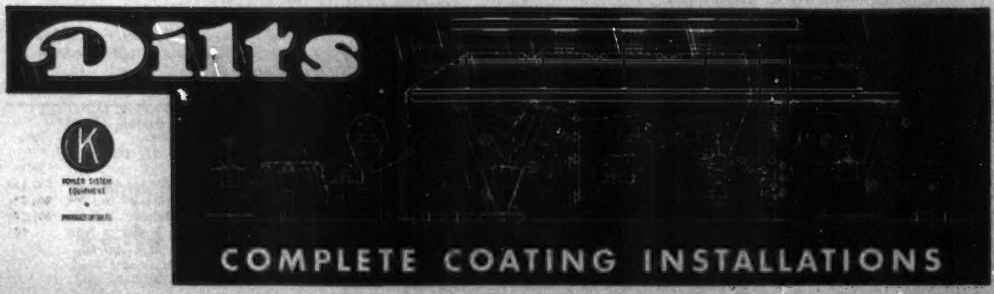
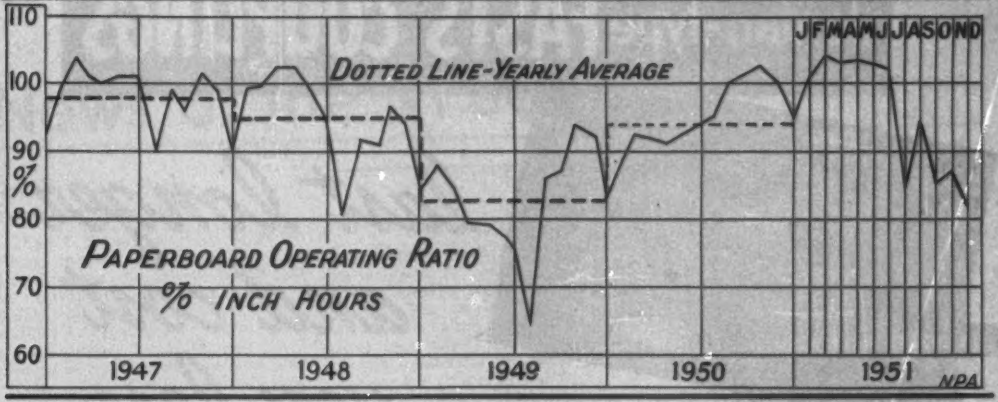


OUR BUSINESS

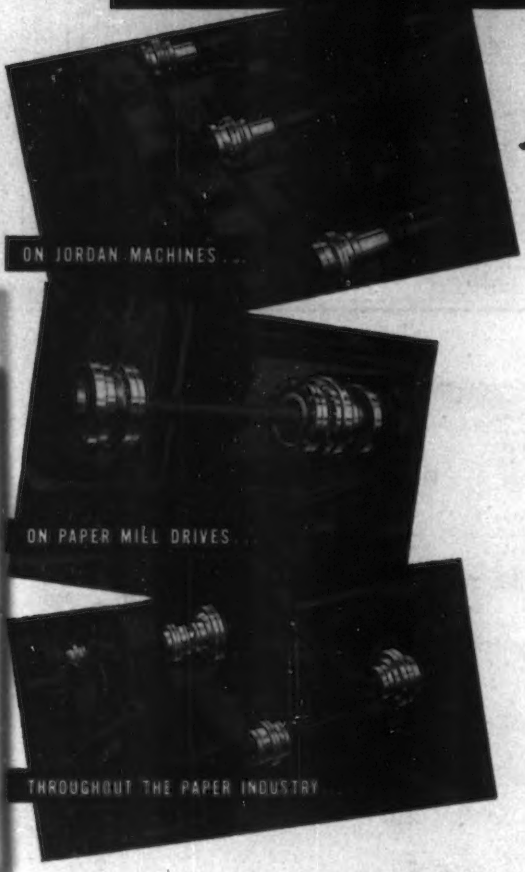


Brief of Important Figures

Source	Production	WEEK ENDING Dec. 15, '51	Nov. 17, '51	Dec. 16, '50
APPA	Paper Production Percent Capacity[2]	97.1	98.9	100.1
	Unbl. Kraft Paper Production Percent	108.8	106.5	98.9
NPA	Paperboard Operating Ratio Percent Inch Hours	86	86	105
		Oct. 1951	Sept. 1951x	Oct. 1950
APPA	Paper Production[6] (Except Newsprint and Building Papers) Tons	957,000	852,577	841,000
	New Orders Tons	941,000	834,911	836,000
	Unfilled Orders Tons	958,800	971,280	899,200
	Shipments Tons	953,000	846,505	850,000
		Nov. 1951	[4]Oct. 1951	Nov. 1950
NPA	Paperboard Production Tons	794,359	1,055,647	1,168,958
	New Orders Tons	685,733	1,110,638	1,225,369
	Unfilled Orders Tons	365,363	487,788	722,046
	Our Customers Activities Index[3]	Latest Mo.[5]	Previous Mo.[5]	Year Ago[v]
FRS	Manufactures Total Index	231	233	229
	Durable Mfg. Index	276	274	263
	Nondurable Mfg. Index	194	199	201
	Chemical Products Index	307	306	282
	Mfg. Food Products Index	178	190	173
	Printing and Publishing Index	181	180	183
ODC	Magazine Advg.-Printer's Ink Index	403	379	342
	Retail Sales Combined Adjusted Index	379.4	372.9	349.1
	Drug Index	253.0	251.4	237.3
	General Merchandise Group Index	394.4	392.2	364.6
	Grocery and Combination Index	446.0	449.6	395.1
	Prices Index			
BLS	Consumers Price Index[1]	187.4	186.6	175.6
	Wholesale all Commodities[2]	178.2	177.6	169.1
	Wholesale Foods[2]	189.5	188.0	172.5
	Commodities other than Farm Products and Foods[2]	166.7	166.9	161.5
	Wholesale Pulp and Paper[2]	200.5	199.7	173.4
	Purchasing Power of Dollar, Consumers Prices[1]	53.4	53.6	56.9
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	429.4	436.9	415.8
	Unemployment Compensation Initial Claims (M)	902	725	720
	Miscellaneous Carloadings–Thousands of Cars	1,664	1,967	1,673
	Electric Output (Million KW hr.)	37,775	35,296	34,338
PTJ	Average 32 P & P Common Stocks as of Dec. 22	$37.43	$37.62	$33.51

[1] 1935-39 = 100 Unadjusted Index.
[2] 1926 = 100.
[3] New 6-7 day basis.
[4] For Five Weeks.
[5] For details see APPA Monthly Statistical Summary—October 1951 Estimated Figures.
[6] Latest Month Available on Request.
x Revised figures.

Jordan-Type FAST'S COUPLINGS



last longer and cost you less

Here's why: Fast's Couplings normally outlast the equipment they connect. For example, take the first Fast's Jordan-Type Coupling, which was installed in 1922. The original Jordan machine was scrapped long ago. But the Fast's Coupling was saved and today that original coupling is still in use on another machine!

Fast's are the best insurance you can buy against needless and costly coupling failures. Because of their rugged construction and foolproof design... their reasonable cost can be spread out over 20 years or more to give you *lowest coupling cost per year.* And with Fast's Couplings, Koppers gives you engineering service unequalled in the industry. Find out about Fast's today!

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News of the Week

Paper TRADE JOURNAL

Dryden Paper Starts Expansion Program

Dryden Paper Co., Ltd., is undertaking an expansion program costing $3,500,000 in its initial stages and which will increase annual capacity to 80,000 tons by the end of 1953, with another stage aiming to increase this annual capacity to 112,000 tons scheduled to be undertaken at a later date.

This expansion, which will be started without delay, will involve the installation of new additional recovery and evaporator plant, a modern refuse and lignite burning steam generating plant, fresh water pumping plant, additional digesters and ancillary equipment.

Columbine's Certificate Extended

The National Production Administration has extended to March 22, 1952, the certificate of necessity granted the Columbine Development Company. Columbine is seeking to develop a $23 million pulp mill near Newcastle, Colo.

Although Columbine's request for a $15 million loan from the Reconstruction Finance Corporation was turned down, the belief is that between now and when the certificate will expire, private capital will be raised for the project. Columbine's contract with the Forest Service for several million board feet of beetle-killed timber in the White River National Forest was extended last June.

Elof Hansson, Inc. Gets "Goat" Agency

Elof Hansson, Inc., 220 East 42nd Street, New York 17, New York, have been appointed sole sales agents in the United States for Bergvik och Ala Aktiebolag, Söderhamn, Sweden. Bergvik are producers of the well known "Goat" brands of unbleached sulphite and kraft pulps.

Sulphur Shortage To Worsen In '52

The world shortage of sulphur, which became pronounced as 1951 wore on, will become worse in 1952 as the rearmament program of the United States and its allies gains momentum, Langbourne M. Williams, Jr., president of Freeport Sulphur Company, predicted.

Despite record production by the American brimstone industry, the discovery of a large new deposit and projects to develop three others, "any significant increase in the overall supply of sulphur is at least a year away," Mr. Williams said in an appraisal for the new year.

U. S. production of sulphur in all forms in 1951 totaled approximately 6,200,000 long tons. Of this amount, it is estimated that 5,325,000 tons was elemental sulphur or brimstone from Gulf Coast salt dome deposits, 200,000 tons was brimstone recovered from refinery and sour natural gases, 400,000 tons was sulphur in pyrites, and the remainder was sulphur obtained in other forms from smelter gases and other sources. Production in 1950 approximated 6,000,000 tons.

While production for 1951 was sufficient to fill domestic needs, it was not enough to meet both domestic and export demand. Government-directed exports to friendly nations took almost 25 percent of Gulf Coast brimstone production. As a result, major brimstone producers were compelled to resort to allocation programs to domestic consumers.

Exports of crude sulphur in 1951 amounted to approximately 1,300,000 long tons or almost 95 percent of the 1950 total. The United Kingdom was the recipient of the largest allocation. Its quota was approximately 400,000 tons compared with 420,000 tons in 1950.

In considering the outlook for 1952, Mr. Williams urged that the government, which has assumed complete control over the distribution of sulphur, limit shipments to the amount actually being produced and that this sulphur be allocated to consuming industries in the best interest of the defense program.

He warned that stockpiles must not be further reduced. Stocks of mined brimstone, he said, are now at a level which is "a minimum for national security." At year's end, these represented about six months' inventory compared with a prewar peak of two years' supply.

"The immediate problem is to make certain that the industries vital to national defense get the sulphur they need to produce the steel, rubber,

Get The Scrap Out!

You Can Be Sure that we are right back where we were in 1943-44, so far as metallic scrap salvage is concerned. The current industrial scrap drive is definitely not producing the steel, lead, copper and other forms of metallic materials we need to fulfill our overall requirements.

You may rest assured that the *defense requirements will get first priority on all metal production.* What is left if any will then be given to the defense supporting industries. The pulp and paper industry ranks in this later group.

The present allotments of metals to the pulp and paper are less than 50 percent of the current requirements. *It is entirely possible and probable that these allotments will be cut more drastically within the coming months.* It will depend on the weather, the military requirements and your scrap collection.

With the industry faced with a current $500 million expansion, with plans underway, money borrowed in many cases, buildings partially completed, this whole program can be disrupted and delayed a year or more.

It is urgent that each pulp and paper mill double and redouble its efforts to get every piece of unusable metal back into the scrap processing channels but QUICK.

We suggest that each mill review again its scrap program and get those old wires, screen plates, obsolete equipment, jordan and beater bars, old tanks and boilers back to the furnaces.

Remember it takes 1000 pounds of steel scrap to make a ton of steel.

Furthermore, we suggest that each supplier salesman make a point of talking salvage on each mill call.

The paper company sales force could do a great service to the country and their industry if they would also sell the scrap drive to their industrial customers.

The munitions, armaments, the new paper machines, the repair parts and maintenance supplies are in the junk piles of industry. *The sooner we get unusable metal into the furnaces, the quicker you can be sure no one will attack us, and we will get the new equipment off the order books and into production.*

NOVEMBER NEWSPRINT REPORT

NEWSPRINT ASSOCIATION OF CANADA, MONTREAL

I. PRODUCTION AND SHIPMENTS in short tons: 2,000 pounds		NOVEMBER 1951	NOVEMBER 1950	NOVEMBER Percent Change	YEAR TO DATE 1951	YEAR TO DATE 1950	YEAR TO DATE Percent Change
1. Canadian Production: including Newfoundland	mo. and year to date	471,732	456,743	+ 3.3	5,080,992	4,848,034	+ 4.8
	per working day	18,144	17,567	+ 3.3	17,903	17,155	+ 4.4
	percent of capacity	104.3	103.2		102.9	100.8	
2. Canadian Shipments: including Newfoundland	to United States	412,044	422,803	— 2.5	4,391,569	4,350,985	+ .9
	to Can. Consumers	30,641	31,394	— 2.4	328,956	322,298	+ 2.1
	to Other Markets	48,335	23,511	+105.6	321,531	188,575	+70.5
	total: all markets	491,020	477,708	+ 2.8	5,042,056	4,861,858	+ 3.7
3. U. S. Production:	mo. and year to date	91,835	87,980	+ 4.4	1,010,012	929,348	+ 8.7
4. U. S. Shipments:	to U. S. Consumers	94,282	83,677	+ 12.7	1,002,041	914,983	+ 9.5
	to Other Markets	1,007	1,464	— 31.2	8,686	14,517	—40.2
	total: all markets	95,289	85,141	+ 11.9	1,010,727	929,500	+ 8.7
5. U. S. Imports from Europe:	*estimate; see Table 8	*19,000	15,070	+ 26.1	193,426	154,428	+25.3

II. CONSUMPTION AND STOCKS in short tons: 2,000 pounds		NOVEMBER 1951	NOVEMBER 1950	NOVEMBER Percent Change	YEAR TO DATE 1951	YEAR TO DATE 1950	YEAR TO DATE Percent Change
6. U. S. Consumption:	estimated total	526,574	533,259	— 1.3	5,389,856	5,416,276	— .5
7. North American Stocks:	U. S. Consumers	789,655	612,927	+ 28.8	789,655	612,927	+28.8
	Canadian Mills	128,078	107,366	+ 19.3	128,078	107,366	+19.3
	U. S. Mills	7,526	10,662	— 29.4	7,526	10,662	—29.4
	estimated total	925,259	730,955	+ 26.6	925,259	730,955	+26.6
8. A.N.P.A. Report: 525 Newspapers	Consumption	402,829	407,943	— 1.3	4,123,240	4,143,451	— .5
	Stocks (tons)	543,388	433,282	+ 25.4	543,388	433,282	+25.4
	Stocks (days)	40	32		40	32	

munitions and hundreds of other items necessary to our security and to the well-being of our economy," he said.

Discussing the long-term outlook for sulphur, the Freeport official said that more than half a hundred projects are being undertaken in 19 Free World countries. These projects may add, he said, as much as 3,000,000 long tons a year to production by 1954.

Of these projects, the most prominent is that of the new deposit at Garden Island Bay in Louisiana which will be the largest sulphur development anywhere in the world in nearly 20 years. A $10,000,000 - $15,000,000 plant with an annual production goal of 500,000 long tons of sulphur is being built by Freeport near the mouth of the Mississippi River. It is scheduled to be placed in operation near the end of 1953.

The year also marked the start of development by Texas Gulf Company of a new mine at Spindletop dome near Beaumont, Tex., the beginning of operations by Jefferson Lake Sulphur Company at its Starks dome in Calcasieu Parish, La., and the start of development of another Louisiana deposit, Bay Ste. Elaine, considerably smaller in size than Garden Island Bay, which Freeport will mine with an "amphibious" plant. These mines and expansion of an existing mine will increase brimstone output by more than 1,000,000 long tons yearly if production plans are realized, Mr. Williams said.

Thank You

Many pulp and paper mills have given their old felts to the American Friends Service Committee. That they are being well received and used is evidenced by the happy expressions on the children's faces.

Thank you and keep it up, the need is still great.

German refugee children shown wearing coats constructed from wool type felts donated by paper and pulp mills in the United States to the American Friends Service Committee. The coats are made by refugees in one of the self help sewing rooms in one of the ten camps where the Friends are working near Oldenburg, Germany, in the British Zone. After the felts are washed clean of acid and dirt the material is dyed. The coats the children are wearing were cheerful bright colors.

Britain Drastically Cuts Imports

Great Britain has advised importers that licenses for paper imports will be cuts 50 percent for 1952.

Machine glazed poster, insulating paper wall paper base, wrapping other than Kraft, and test liner will be excluded. Strawboard and paper, Kraft liner, and greaseproof will not be cut to the 50 percent reduction.

United to Install Suction Drum Rolls

United Board and Carton Corporation, Syracuse, New York, will install suction drum rolls and electrical wet end drives in its three paperboard mills. The new equipment, which involves a $50,000 expenditure will result in production of higher quality paperboard.

The company's Thomson, New York mill will be equipped first.

The installation will consist of an electrically driven Beloit suction drum roll. The 20" vacuum necessary to run this roll will be developed by a Root-Connersville vacuum pump driven by a 75 HP motor. This pump produces 1660 C.F.M., at 1160 R.P.M.

The electrical drive powers the top first press roll, the two bottom helped rolls and the suction drum roll. This will permit the use of a finer felt which will result in a better finish board and longer life on the felts at reduced cost per ton.

New International Converting Plant

The International Paper Company formally opened its $1,000,000 paper converting plant at 2323 N. Sylvan Rd. in East Point near Atlanta, Ga. on Dec. 7.

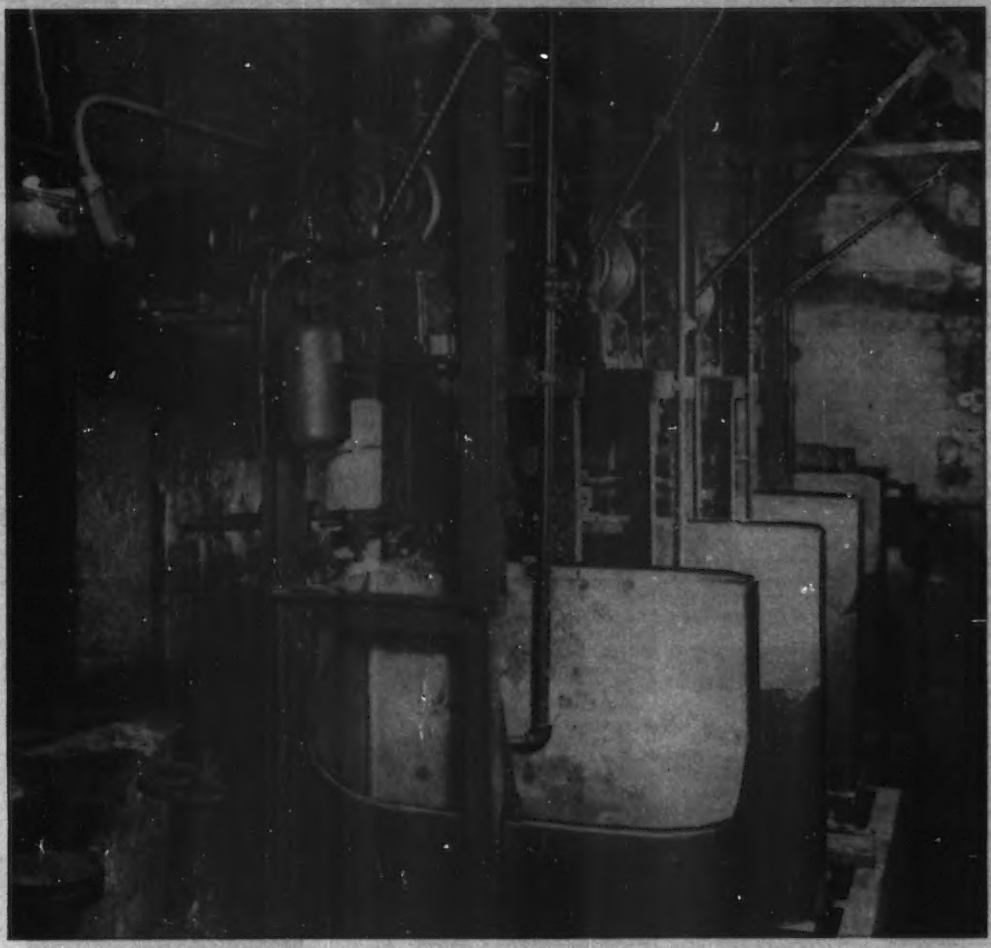
The 55,000 square foot, one-story brick structure will be devoted exclusively to production of milk containers for distribution in Georgia, Florida, the Carolinas, Alabama and Tennessee.

Officials, here for the opening, said the decision to locate the plant in the Atlanta area reflected the growth of the dairy industry in the southeast.

"Equipment at the new plant includes three cutting, creasing and printing presses, and six folding-gluing machines. These facilities are designed to produce at the rate of 30,000,000 Pure-Pak containers a month."

At present, the company employs 75 persons in the new plant. Plans call for doubling employment within the next year if the volume of business

TO KEEP STOCK CONSISTENCY *Consistently* UNIFORM



You NEED BIRD CONSISTENCY REGULATORS

Bird Regulators are easy to install—take up little space. But, best of all, they work and keep on working day in and day out, holding consistency at not more than 0.1% heavier or lighter than desired. You just set them and forget them.

Ask us for layouts and estimates

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

continues to grow at the present rate, D. D. Milson, plant manager said.

Other local officials are G. G. McArnerney, superintendent; O. W. Hamilton, planning department manager, and W. J. Turner, office manager.

Dixie Cup Expands Toronto Plant

Dixie Cup Co. (Canada) Ltd., a subsidiary of Dixie Cup Co. of Easton, Pa., is spending $300,000 on the new addition at its Toronto, Canada, plant.

The expansion, which will be completed next spring and will increase employment to 150 persons was made necessary by increased demand for the company's paper cups and containers.

Hawthorne Scholarship Open to Applicants

The Pulp and Paper Scholarship Committee at Western Michigan College announced today that applications may now be submitted for the newly established $1,600.00 Hawthorne Paper Company—William Slavin Scholarship. These applications may be submitted by any graduate of the Kalamazoo area high schools providing he is qualified to enter the Curriculum of Pulp and Paper Technology at Western Michigan College in February 1932. Freshman presently enrolled as college students who are graduates of area high schools and are interested in studying Paper Technology are also eligible for the award.

PEOPLE

FOSTER P. DOANE, JR., who has been associated with the Sandy Hill Iron and Brass Works since 1942, will leave Glens Falls in January to accept a position as production manager of the Bergstrom Paper Company of Neenah, Wisconsin. He has resigned his position with Sandy Hill effective the first of the year.

Mr. Doane first came here in 1930 as research engineer for the International Paper Company mill at Fort Edward, later becoming general superintendent. He joined Sandy Hill in 1942 and served first as chief inspector, then plant manager, and this year became assistant vice president.

A native of Cambridge, Mass., Mr. Doane attended Massachusetts Institute of Technology, graduating with a Bachelor of Science degree in chemical engineering in 1920. During the next four years, he took courses at Boston University in business administration and at Harvard University in literature, writing and speaking. For 10 years following his graduation from MIT he was in the textile business with his father Foster P. Doane, Sr., in Boston.

Mr. Doane has traveled extensively in connection with the sale of pulp and paper making machinery. During this past year he visited 17 countries in Europe. He is a member of the Technical Association of the Pulp and Paper Industry and vice chairman of the Empire State Section; a member of the American Pulp and Paper Mill Superintendents Association and the Canadian Pulp and Paper Association.

W. R. KELLETT and R. W. LYONS, have been named vice presidents of Kimberly-Clark. Mr. Kellett will be in charge of manufacturing operations for Kimberly-Clark. Mr. Lyons, at one time, was woodlands chief for Spruce Falls Power and Paper Company, Ltd., a subsidiary of Kimberly-Clark.

F. S. SEABORNE has been appointed assistant vice president and general superintendent. W. H. SWANSON has been named assistant vice president and director of research and development.

GUY M. MINARD and R. J. APPERT has been made vice presidents of Spruce Falls. Mr. Minard is plant manager of the newsprint mill at Kapuskasing, Ont., and Mr. Appert is in charge of the Spruce Falls service department in New York.

G. G. COSENS, manager of Kimberly-Clark and related woodland operations in Canada, will move from Toronto to Neenah, Wis., as general manager of all woodland operations; G. W. PHIPPS will become assistant general manager of woodland operations, moving his headquarters from Kapuskasing to Toronto; F. L. PLATT of Kapuskasing will replace Mr. Phipps as manager of woodlands for Spruce Falls, and J. B. MILLAR of Neenah has been named chief forester for Kimberly-Clark and affiliated companies.

B. J. DONOVAN of Toronto, a member of the Spruce Falls organization for many years, has been named a director of public relations for that company.

PAUL A. WILKS was elected treasurer of the Strathmore Paper Company succeeding F. NELSON BRIDGHAM in this position. Since the death on July 3rd of Mr. George E. Williamson, who was chairman of

(Continued on page 34)

Paul A. Wilks

Nepco's Annual Sales Conference

The annual Nekoosa-Edwards sales conference held recently at Port Edwards, Wis., was attended by the following, left to right, front row: T. R. Meyer, advertising manager; C. A. Schiebler, assistant general sales manager; R. E. Hart, The Cramer-Krasselt Company; Karl F. Schmidt, Minneapolis; W. A. Radke, treasurer, G. B. Higgs, Atlanta; W. E. Nash, Chicago; R. C. Farnsworth, Los Angeles; and H. J. Hostvedt, Port Edwards.

Second row: H. N. Pasteur, The Cramer-Krasselt Company; Donald Lichty, Port Edwards; C. A. Polansky, manager order department; R. L. Gresch, Dallas; A. C. Remley, vice president in charge of sales; John E. Alexander, president and general manager; M. A. Vanderheiden, manager New York office; N. E. Nash, vice president; L. A. Gardiner, Chicago; R. W. Herzog, Erie; G. S. Booton, New York; Eileen Schroepfer and Margaret Olson, secretaries.

Third row: Kendall Green, Port Edwards; K. B. Podvin, Port Edwards; Ward Rosebush, Atlanta; W. M. Kersten, Chicago; C. A. Hodlmair, manager Chicago office; R. W. Flicker, Kansas City; J. H. Menske, Chicago; D. H. Boles, Port Edwards; M. E. Love, N. Y.; L. J. Lyons, Chicago; G. E. Veneman, Chicago; L. G. Mortell, Port Edwards and Keith Roberts, publications editor.

A.P.W.

ONLIWON

INDUSTRIAL
TOWELS
TISSUE

Here's a machine sufficiently heavy to be used either as a Rewinder or as a Winder behind a paper or board Machine. Built in widths from 62" to 92" and to handle diameters up to 50", or on special orders, 60". Ask for Bulletin 204 describing other sizes.

LANGSTON

SLITTERS and

WINDERS

SAMUEL M. LANGSTON COMPANY, CAMDEN, N.J.

GOVERNMENT GOSPEL

CPR 108 Boxboard and Containerboard

Effective December 26, the following prices will be OPS ceilings: For quantities of 10 tons or more *Non Bending Boards and Chip Can and Tube*

No. 1 gauge list 50's-90's

	Per ton
Plain chip	$105.00
News vat lined chip	107.50
Filled news	110.00
Solid news	112.50
White vat lined chip	142.50
Chip tube and can	110.00
Special ammo tube	
Type I	117.50
Type II	125.00
Gypsum Lath	117.50
Gray back	120.00

Folding Boards

No. 2 gauge list 50-90s	
SML chip	$147.50
SJL chip	145.00
Mist gray L chip	145.00
Bl. Man. L Chip	150.00
Semi bending and creasing chip	110.00
Bending chip	115.00
Gypsum cream faced	160.00

Single White Patent Coated

#6 Gauge list	
.020 and heavier	$175.00
.018	177.50
.016	180.00
.015	182.50
.014	185.00
For lighter or heavier weights non bending and folding grades. Up charges per ton.	
Regular 35-39's	$7.00
40-48's	3.00
91-100's	6.00
101-120's	9.00
Skim news back	2.50

Containerboard, carload lots, Fourdrinier Kraft Base price

26# M square feet 60# test	$1.59
32# " " " 75# "	1.96
33# " " " 75# "	1.96
38# " " " 85# "	2.23
42# " " " 100# "	2.47
47# " " " 105# "	2.76
50# " " " 110# "	2.94
52# " " " 115# "	3.06
69# " " " 135# "	4.18
90# " " " 150# "	5.51

Cylinder Kraft Linerboard

47-48# M square feet 100# test	$2.60
50-52# " " " 110# "	2.76
55# " " " 120# "	3.23
72# " " " 135# "	4.18
90-95# " " " 135-160# "	5.51
90-95# " " " over 160# "	5.74

100% Kraft ammo

80# .025 190" test	6.64

Jute Linerboard

48-66# M square feet 270-85" test	$3.63
48-66# " " " 85-100# "	3.76
48-66# " " " 100# plus "	3.85
72-80# " " " 125# plus "	4.70
110# " " " 135# "	6.46

Lightweight Chip

.006-.016	122.50

Bogus Corrugating

26# M square feet	1.82
28# " " "	1.96

Strawboard

26# M square feet	1.59
28# " " "	1.72
30-32# " " "	1.85

Semi-chemical

26# M square feet	1.59

CPR 107 Lake State Pulpwood

On December 24, 1951, the following ceiling prices on pulpwood will be effective in Minnesota, Wisconsin, and Michigan. F. O. B. car or at landings on Great Lakes or connecting waterway:

TABLE I

Species	Rough	Peeled
Spruce	$25.00	$30.00
Balsam fir	22.00	27.00
Jack pine	18.00	23.00
Hemlock	18.00	23.00
Tamarack	16.00	21.00
Poplar	14.00	19.00
Poplar (special 55-inch length)	16.80	21.80
White birch	15.00	20.00
Miscellaneous hardwoods	13.00	18.00

In the normal 100-inch lengths, a cord be not less than 128 cubic feet or more than 133⅓ cubic feet. For poplar in 55-inch lengths 147 cubic feet per cord. The higher ceiling is allowed to compensate for higher cost.

Business Press Scrap Meeting

Charles E. Wilson, Director of Defense Mobilization, and Manly Fleischmann, Administrator of the Defense Production Administration and the National Production Authority have warned of setbacks to the mobilization effort if steel mills are forced to shut down because of shortages of iron and steel scrap.

They spoke at a meeting of business press editors and publishers called to Washington to help in the critical scrap situation.

Mr. Fleischmann said that any shutdown for lack of scrap would be "a national catastrophe and a tremendous road-block in the way of the whole mobilization effort."

Mr. Wilson told the editors: "If we build our might, peace is possible. If the job is done right, I don't think there will be any World War III. The word now is 'urgency.' The goal of peace is still in our hands. But you cannot deal with the Russians except from a platform of might. We must create an understanding of the urgency of the situation."

He told the editors that they might be the keystone to the scrap situation and thus to production for defense by pointing out the urgent need for scrap to businessmen in every field.

Mr. Fleischmann explained that mill stoppages would hit every segment of industry because it is impossible to rearrange production schedules so that only one segment of the economy is affected.

The scrap situation is a little better today than it was a few week ago only because collections have not as yet been affected by weather, Mr. Fleischmann said.

Tom C. Campbell, editor of *Iron Age* and a member of the NPA Business Press Advisory Committee, said that many mills are operating today only because they have been unloading scrap shipments directly from delivery cars into blast furnaces. Dramatizing the fact that cold weather in the next three months will slow up scrap collection and put the mills in a "bad way," Mr. Campbell pointed to snow falling outside and estimated that scrap collections in the Washington area had fallen off 5 percent since the meeting began.

GSO8 Extended Work-Engineers

The Salary Stabilization Board issued a regulation covering extended work week salary adjustments for engineers practising their profession. The conditions are: (a) An employer who on or prior to January 25, 1951, had a plan or practice of paying engineers additional compensation for hours in excess of normal hours may continue such plan or practice. (b) An employer without a plan or practice may pay straight time for the additional hours worked. Engineers in executive, administrative, or in outside sales capacity are not eligible.

1st Quarter Structural Steel For Industrial Expansion

On December 14, National Production Administrator Manly Fleischmann announced allotments of structural steel for the first quarter of 1952 for expansion of the nation's industrial facilities. He noted that approximately 80 percent of the available supply of structural steel for industrial expansion will go into direct military and defense-supporting industries.

P&P Certificates of Necessity Now $511,916,000

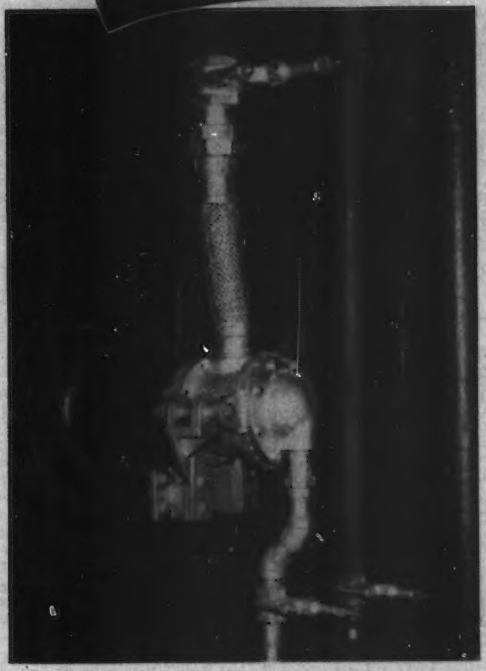
Certificates of necessity for expansion of paper and paper products facilities approved through October 19, 1951, involved a proposed investment totaling $511,916,000, the Defense Production Administration reported this week.

Tax amortization allowed totals $269,488,000, while the DPA has approved 52.6 percent of the proposed investment for tax amortization.

In addition to these, DPA has approved facilities for alkalies and chlorine production with an aggregate of $230,614,000 proposed investment, of which 44.4 percent has been approved for tax amortization, and $404,808,000

(Continued on page 46)

Type N JOHNSON JOINTS



The Johnson Joint shown on this large paper machine cylinder is Type 750L-NA, designed for use with rotating syphon pipes. The L-NA has lugs cast on body of the joint to permit simple rod support. For more details on support see drawing at right.

On large paper machines operating at speeds above 1200 feet per minute and at 50 lbs. or more pressure, the Johnson Joint is again proving its ability to take it. The Type "N" is a version of our standard Joint and is especially designed to handle rotating syphon pipes. In fact the rotating syphon pipe becomes an integral part of the Type "N" Joint rotating assembly, yet it can shift longitudinally.

In constant service on these large machines, Johnson Joints have run many months without repair or maintenance. Because they can handle pressures up to 150#, they also afford wide latitude for any future increases in operating pressure. Furthermore, they readily fit into existing piping arrangements.

Bulletin "N" describes in detail the operation and application of Type "N," "NA" and "L-NA" Johnson Joints — write for your copy.

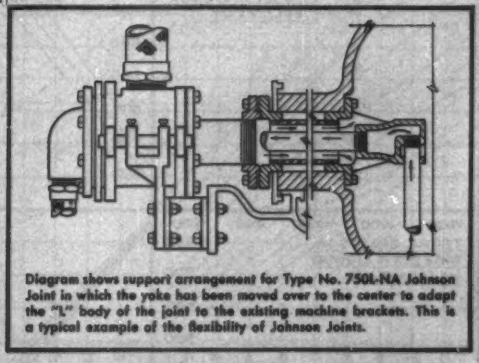
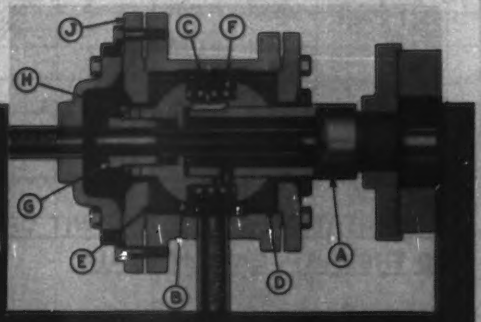


Diagram shows support arrangement for Type No. 750L-NA Johnson Joint in which the yoke has been moved over to the center to adapt the "L" body of the joint to the existing machine brackets. This is a typical example of the flexibility of Johnson Joints.



Products of The Jc

828 Wood St., Three Rivers, Mich.

Rotary Pressure Joints • Compressed Air Separators and Aftercoolers
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters

Recovery Evaporation and Burning of Sulphite Waste Liquor in Sweden*

Part II

Bengt Brunes
Civil Engineer, Swedish Steam Users Assn., Stockholm, Sweden

(Continued from last week)

The evaporator (see chart, page 30, *PTJ*, Dec. 21, 1951) is in four stages and heat consumption is 182 Kcal per Kg. evaporated water. Heat consumption is taken to mean the amount of heat in the live steam used. The condensate which is used to wash the heating surfaces is acidic and cannot, therefore, be returned to the boiler house. There is nothing to prevent a transfer of the condensate's heat energy in a heat exchanger to water which can be used in the factory or as feed water to the boilers.

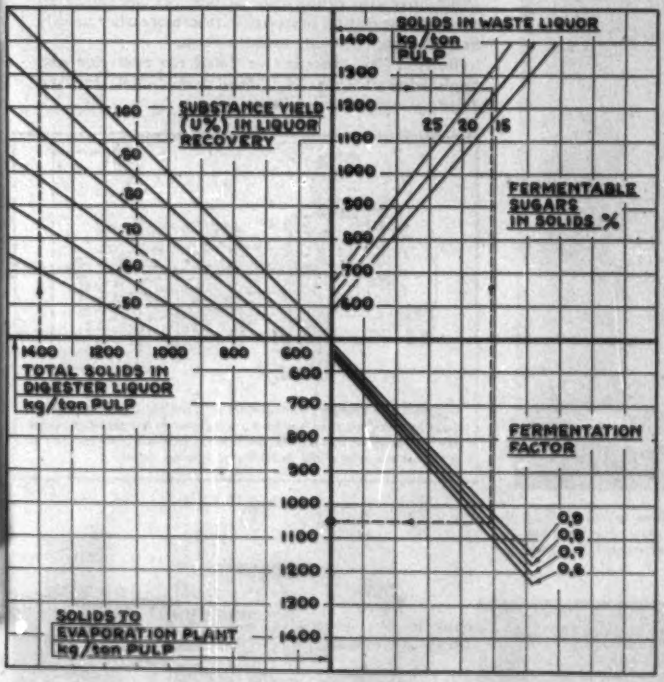
When calculating the heat consumption of an evaporation plant, all secondary heating effects (available warm water) must be taken into account. Since the liquor must be warm when introduced into the evaporation plant, there exists no possibility of warming water through the cooling of the liquor, an opportunity which is taken advantage of in Sweden. This warm water, however can partly—often entirely, or in excess—be replaced by warm water from the surface condensor and warm water produced by the cooling of the condensate from the evaporation plant.

It is of the greatest importance in calculating the profit derived from an evaporation plant, that due regard be paid to these secondary heating effects which vary from mill to mill.

The most economical form of evaporation plant from a heat consumption point of view is, however, the counter-pressure installation. This is so arranged that the whole evaporation process takes place at higher than atmospheric pressure, and steam from the final evaporator is used for some other warming purpose in the factory. Since the steam is now acidic it may only be used directly in heat consumers which are suitably fitted i.e. acid resisting external digester heater in the cooking plant, stripping columns in the alcohol plant etc. If no such possibilities exist then the steam must be transformed to pure steam in a heat exchanger which requires a certain temperature difference and therefore produces a pressure loss necessitating a consequential higher average working pressure in the evaporation plant.

Very great care must be exercised when selecting a heat consumer for steam from counter-pressure evaporation plants. It is essential that the steam consumption should be uniform in order to avoid pressure- and temperature-variations in the evaporator. Furthermore it is essential that the heat consumer is of such a type that its steam requirement is reasonably permanent. Just because a counter-pressure evaporator has been installed, this should be no excuse, from either a heat consumption viewpoint or any other, for the continued use of a heat consumer which is by no means modern.

As opposed to conditions in a vacuum plant, the number of stages in use in a counter-pressure plant has no bearing on heat economy, since steam from the final stage is used to supply heat to other processes which could also be credited to the evaporator. On the other hand—given a constant steam supply from the last stage — the capacity of a counter-pressure station is in direct proportion to the number of stages. The highest steam-pressure which can be employed in waste sulphite liquor evaporation is determined partly through the increased scale-forming tendencies at higher temperatures and partly through the fact that the organic substances present in the liquor alter with a con-



COMPUTATION OF THE AMOUNT OF SOLIDS TO THE EVAPORATION PLANT

Figure 5

sequential increased viscosity and loss of dry material. This higher limit is not yet known, but on the basis of present research it is assumed to lie at 7-10 Kg/cm² (100-142 PSI).

From this it may be seen that a heat consumer for steam from a counter-pressure station should be chosen which requires a relatively low steam pressure.

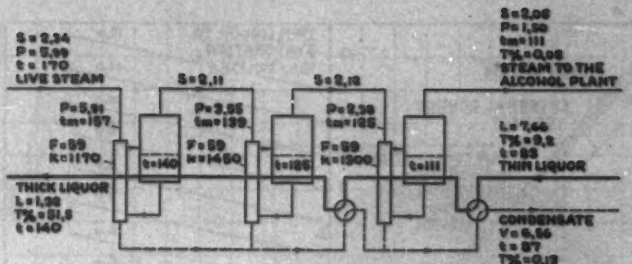
In counter-pressure installations now in operation in Sweden stripping columns in alcohol plants, external digester heaters in the cooking plant and paper machines are chosen as heat consumers. Smaller quantities of counter-pressure steam are also used for the warming of feed water and the production of warm water.

Figure 6 shows results of a production sample from a counter-pressure station in Kvarnsvedens Paper Factory. Installation of the machine was carried out by Rosenblads Patenter. Heat consumption, calculated in the same way as for a vacuum station in *Figure 4*, is 38 Kgcal/kg (68.5 BTU/lb.) water evaporated. This explains why—in spite of the problems and difficulties encountered in counter-pressure evaporation—this solution to the evaporation question is being followed up.

At the turn of the year 1950/51 the largest Swedish evaporation plant commenced operation at Domsjö Sulphite Factory. It is designed to work with a steam pressure of 9.5 Kg/cm² (135 PSI), when the capacity of the installation would correspond to about 55 tons of water evaporated per hour. There are four effects, steam pressure in the final effect being 1 Kg/cm² (14.22 PSI).

With a view to the risk for decomposition of the waste liquor and incrustation difficulties at higher pressures it has already been considered uncertain as to how a steam pressure of 9.5 Kg/cm² (135 PSI) could be utilized. The station is now operating at a pressure of 7 Kg/cm² (99.5 PSI) and trial runs have been made with liquor from various qualities of pulp such as rayon pulp and paper pulp of coniferous and deciduous origin. Only for a short period, from which no conclusions may be drawn, has the installation been operated at its highest steam pressure.

Raméns Patenter have installed vacuum plants for the evaporation of fermented liquor where evaporation and alcohol distillation take place simultaneously. The condensate from the stages containing alcohol are transferred to the alcohol plant for final distillation. When the amount of alcohol condensate is less than the amount of fermented liquor, the steam required by the stripping columns is correspondingly decreased. If the evaporator is thus credited with the decreased heat consumption in the alcohol plant, then the heat consumption of the evaporator is lower than that for a corresponding vacuum installation. Heat economy in the plant may



WATER EVAPORATED	6,58 ton/hr
SPECIFIC HEAT CONSUMPTION (EXCL. THE SENSIBLE HEAT OF THIN LIQUOR)	38 kgcal/kg WATER EVAP.
LOSS OF SOLIDS IN STEAM AND CONDENSATE	10 kg/hr
LOSS OF SOLIDS, NOT ACCOUNTED FOR	22 kg/hr
ACCUMULATED LIQUOR	15 kg/hr
ACCUMLATED SOLIDS	~ 8 kg/hr
STEAM IN AIR REMOVAL	~ 40 kg/hr

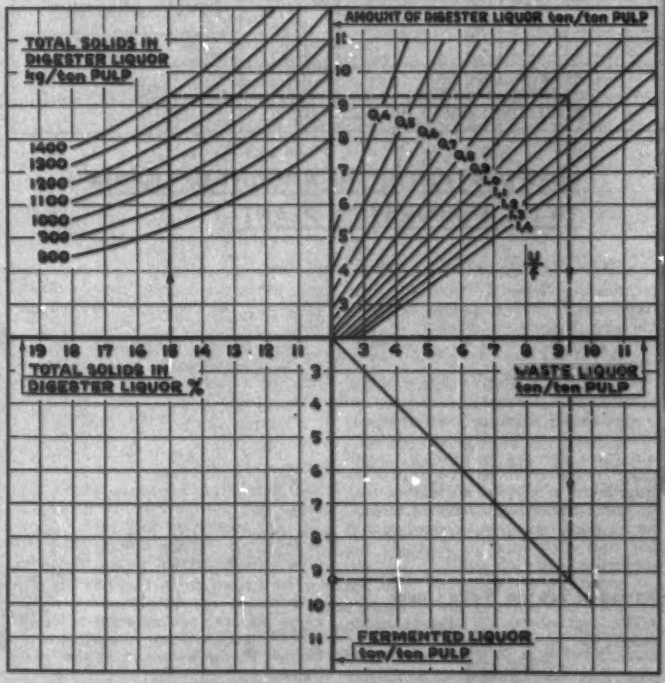
KEY

S	STEAM	ton/hr
L	LIQUOR	ton/hr
V	WATER	ton/hr
T%	DRY CONTENT	%
P	ABSOLUTE PRESSURE	kg/cm²
t	TEMPERATURE	°C
tm	SATURATION TEMPERATURE	°C
F	HEATING SURFACE	m²
k	APPARENT HEAT-TRANSFER COEFFICIENT	kgcal/m² hr °C

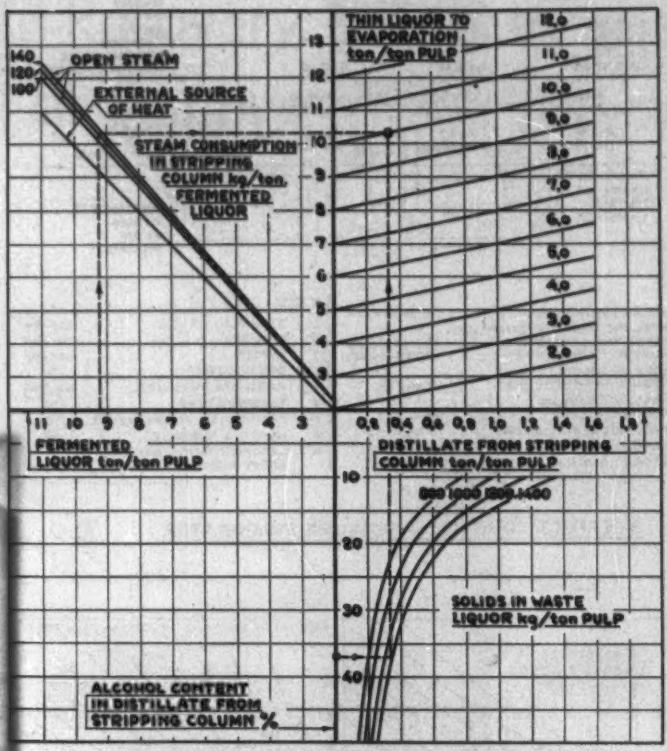
3-EFFECT COUNTER-PRESSURE EVAPORATOR

Figure 6—Above

Figure 7—Below



COMPUTATION OF THE AMOUNT OF FERMENTED LIQUOR (=LIQUOR TO THE STRIPPING COLUMN)


THIN LIQUOR TO EVAPORATION ton/ton PULP
OPEN STEAM
EXTERNAL SOURCE OF HEAT
STEAM CONSUMPTION IN STRIPPING COLUMN kg/ton FERMENTED LIQUOR
FERMENTED LIQUOR ton/ton PULP
DISTILLATE FROM STRIPPING COLUMN ton/ton PULP
SOLIDS IN WASTE LIQUOR kg/ton PULP
ALCOHOL CONTENT IN DISTILLATE FROM STRIPPING COLUMN %

COMPUTATION OF THE AMOUNT OF LIQUOR TO THE EVAPORATION PLANT

Figure 8

be improved by using steam from the evaporators for stripping columns, whereby a certain amount of the evaporation is carried out in counter-pressure.

Seventeen Swedish sulphite waste liquor evaporation plants are in operation today. Even if water-contamination has been the incentive, in certain cases, for the inclusion of waste liquor evaporation on the expansion programme, it may be maintained that all plants have been calculated to produce a good return on invested capital and thus contribute to decrease the production costs of pulp.

Burning of Sulphite Waste Liquor

The dry content of sulphite waste liquor has a net calorific value of 3,900 - 4,200 Kgcal / Kg (7,000 - 7,600 BTU/lb). The amount of ash after burning varies between 7 and 15 percent calculated on the dry content with an average of about 10 percent. The amount of ash approaches the lower limit if the waste sulphite liquor fuel is made from digester liquor, the higher limit if made from slop from the stripping columns. The amount of ash is also influenced by conditions governing the cooking of the sulphite pulp.

The amount of flue-gases obtained when sulphite waste liquor is burned may be calculated from the formula

$$V = 21.5 \frac{\text{Wet}}{CO_2 + SO_2} + 0.127$$

Wet Nm^3/Kg. dry solids where Wet is the net calorific value in 10^3Kgcal/-Kg. dry solids and CO_2 and SO_2 the amounts of carbon dioxide and sulphur dioxide present in the flue-gases.

The first term in the formula corresponds to the quantity of dry flue-gases and the second term refers to the amount of vapor formed by combustion of the hydrogen in the waste liquor.

If the waste liquor is burned in a wet condition, the amount of water in the fuel must, in a vapour form, be added to the quantity of flue-gases. The first term also nearly corresponds to the amount of air required by the combustion.

Waste liquor burned in the form of a dry powder has produced very favourable results. One essential condition is that the powder is ground to a fineness corresponding to that of pulverised coal as used for the same purpose. Earlier attempts to burn waste liquor which had been dried in hot flue-gases and transferred directly to the furnace resulted in very poor results due to the large amount of unburnt liquor collecting on the grate. Waste liquor powder, introduced into the furnace through a pulverized coal burner of modified construction, catches fire quickly and burning should take place with a small excess of air, i.e. high carbon dioxide content.

In earlier times experience showed that burning of dry waste liquor powder caused severe deposition of ash on the boilers super-heater and on parts of the screen tubes between the furnace and the super-heater. At the same time it was determined that ash-deposition was considerably less serious during the burning of evaporated waste liquor of about 50-60% dry content. Since the drying of waste liquor to a powder was a costly business, the burning of dry waste liquor powder ceased in Sweden and wet liquor was exclusively used.

Apart from some attempts in the early stages of sulphite waste liquor burning e.g. allowing 50% dry evaporated waste liquor to run on to burning hog-fuel, the liquor is introduced directly into the furnace with the help of a burner, more or less similar to a fuel-oil burner.

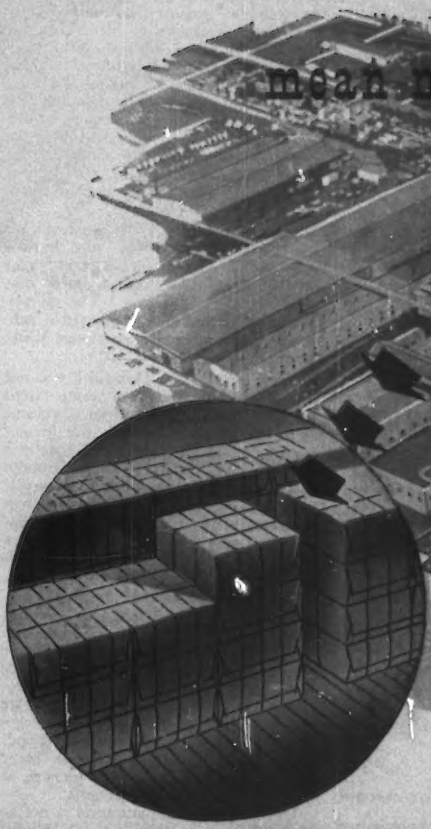
Evaporated waste sulphite liquor with a dry content of up to 50 or 60% has a somewhat higher viscosity than heavy fuel-oil. If the waste liquor is required to have the same degree of fluidity as fuel-oil it is necessary to warm the waste liquor up to between 100° and 140° C.

Varying types of burner have been tried, the majority employing liquid pressure but also several using compressed air or steam as an injection medium. In the first type of burner the liquid pressure has varied between 5 and 15 Kg/cm^2 (70-210 psi). The percentage of waste liquor in the total fuel introduced into the furnace has been varied over wide limits. In some cases about 50% dry content evaporated sulphite waste liquor has been burnt alone without other fuels in which the four walls of the furnace were without wall tubes. Lacking practical research, it is naturally difficult to decide whether burning could take place with wall-tubes or—without wall tubes—at a lower concentration of liquor. Observations concerning related experiments seem to support the opinion that it is not possible without special precautions (e.g., an arrangement of muffles around the burners) to obtain a sufficiently high temperature to support further combustion.

Meanwhile practical experience has shown that spray injection of waste liquor into the furnace produces satis-

"Packaged Mills"

mean more woodpulp



Close integration of the various wood-processing plants at a Weyerhaeuser Timber Company mill and full diversified manufacturing are very much evident in the company's pulp manufacturing centers. Improved technology at the mill sites, with greater accent on better utilization of what was previously considered waste material, is a real answer to a permanent forest industry.

Weyerhaeuser's sulphate mill at Longview, Washington, is a step forward in whole crop utilization. In this manufacturing center, sawmill leftovers and logs not suited for lumber are converted into sulphate pulp. The kraft pulp mill utilizes Douglas fir slabs, edgings and trimmings from the sawmills and Douglas fir peeler cores from the plywood plant. Many technological advances make this process economically sound. Not the least of these is a hydraulic barker for saw logs, which means that bark-free milling leftovers now can go directly to the chipper without further handling.

"Packaged Mills", supplied by well managed "Tree Farms", will provide the Pulp Division, Weyerhaeuser Timber Company with more and more woodpulp in the years to come.

WEYERHAEUSER

factory combustion in exceptional cases only. This is practically irrespective of the type of burner used, and is independent of the amount of fuel admixed and the furnace temperature. On the average the loss of unburnt material in the form of fly-ash is responsible for an efficiency loss of 5 to 6 percent. In certain cases a lower loss has been observed, in others considerably higher.

In this connection it should be mentioned that one should not be misled by the composition or appearance of the ash in the furnace (18). As a rule this ash remains suspended in the furnace for a considerable time and is therefore white and well burned even when the stack fly-ash does not satisfy requirements with respect to color and content of unburnt material.

A great step in burning technique was taken when the problem of burning waste liquor in a heat insulating muffle was solved by a special installation in Loddby Sulphite mill (19). This consists of a fire-brick lined cylinder, one end of which is open or partially so, and connected to the steam boiler furnace. The waste liquor burner is placed in the opposite end. The burner consists of a burner for liquid fuels with a steam appliance for the atomizing of the fuel. Air for the combustion is introduced tangentially into the periphery of the muffle. The installation in Loddby was tested in February 1950, with results as shown in *Table I*, in the left-hand column. Efficiency, as is always the case in Sweden, is calculated on the net calorific value of the fuel.

The steam boiler consists of a water-tube boiler of an old type which explains the relatively high losses under "radiation and undetermined" running as high as 10 percent. Flue-gases from the furnace pass through a central boiler-house economiser but the table shows only experiments performed with the boiler alone. The results of burning have proved satisfactory as shown in *Table I*. The waste liquor combustion has, on introduction to the boiler furnace, been 80 percent to 100 percent complete according to a special investigation and the final combustion has taken place when the flue gases have passed through the boiler furnace.

As may be seen from Mono-diagrams recorded in connection with trials undertaken, the CO_2-content in the muffle outlet has practically never been below 15 percent which has meant even combustion. The fact that the CO_2-content of the furnace has been much lower than in the muffle outlet depends on the boiler being equipped with a stoker, the damper of which was not absolutely tight during the tests.

About 4 percent of the amount of steam generated has been used to atomize the waste liquor fuel. It is naturally desirable to decrease this loss which was also successful in a test with a similar burning installation at Domsjö Sulphite Factory. These results have been assembled in *Table I*, right-hand column. In this installation there is an economiser directly connected to the boiler, however, excluded from the test figures in order to simplify comparison with the Loddby tests.

The dry-content of the waste liquor was 55.8 percent. The fuel burned with a CO_2 content in the stack gases of 12.7 percent, without unburnt material in the flue-gases. The fly-ash contained 3.8 percent combustible substance, but was even then almost white in appearance.

In the research at Domsjö it was not possible to burn as much waste liquor per cu. metre muffle furnace volume as in the muffle at Loddby, the former corresponding to 2,150,000 Kgcal/m³h (15,340 BTU/cu. ft.). In an attempt to increase the quantity of waste liquor burned complete combustion was not obtained. The Domsjö installation has only been in operation for a short time and cannot yet be considered trimmed to produce the best possible performance.

From research carried out it seems possible to draw the conclusion, that the burning of waste sulphite liquor in a heat-insulating muffle can produce very good results. Through this procedure it is possible to burn waste liquor alone, independent of the coinstruction of the boiler and independent of the fact as to whether there are wall tubes in the boiler furnace or not.

Unfortunately the situation is not so bright with respect to the ash deposition on the boiler tubes. In the very first attempt to burn waste liquor which was evaporated to a dry content of 50-60 percent there was no difficulty with ash deposition. In this way faulty conclusions were drawn which

TABLE I

RESULTS OF TESTS ON SULPHITE WASTE LIQUOR-FIRED BOILERS, EQUIPPED WITH "LODDBY"-MUFFLES

	Loddby	Domsjö
Factory		
Boiler:		
Type	Water tube boiler	
Heating surface ..... m²	274	456
Do. as wall tubes in furnace ..... m²	0	76
Superheater surface ..... m²	Unknown	154
Volume of furnace (excl. "Loddby"-muffle) ..... m³	27.5	74
Volume of "Loddby"-muffle ..... m³	2.0	3.2
Test day	23/2/50	21/2/51
Steam and feed water		
Superheated steam:		
Quantity of steam generated ..... metric ton/h	7.89	8.48
Steam pressure ..... Kg/cm²	9.6	19.3
Steam temperature ..... °C	245	298
Feed water:		
Quantity ..... ton/h	7.89	8.48
Temperature entering boiler ..... °C	146	160
Heat content entering boiler ..... Kcal/Kg	147	161
Sulphite waste liquor		
Weight of fuel burnt ..... Kg/h	2,960	3,170
Net calorific value ..... Kcal/Kg	2,330	2,100
Do., calculated on dry substance ..... Kcal/Kg	4,190	4,220
Dry substance ..... %	61.1	55.8
Ash, calculated on dry substance ..... %	10.0	12.7
Liquor burner:		
Liquor pressure ..... Kg/cm²	4.9	7.7
Liquor temperature ..... °C	85	118
Steam for atomizing ..... Kg/h	330	117
Steam pressure ..... Kg/cm²	6.4	5.7
Steam temperature ..... °C	225	212
Flue gases leaving boiler		
Temperature ..... °C	360	323
Percentage of CO_2 ..... %	11.5	12.7
Unburnt carbonaceous flue gases ..... %	a little	0
Dewpoint		
SO_2-dewpoint ..... °C	82	80
Water content-dewpoint (calculated) ..... °C	54	54
Increase of dewpoint ..... °C	28	26
Dust in flue gases		
Quantity ..... Kg/h	180	230
Unburned substance of dust ..... %	0.6	3.8
Specific figures		
Load of heat in "Loddby"-muffle ..... 10^3Kgcal/m³h	3,540	2,150
Steam generated per m² heating surface ..... Kg steam/m²h	29	18
Do. ..... 10^3Kgcal/m²h	16	10
Heat balance		
Heat input (sulphite waste liquor) ..... %	100	100
Heat distribution		
Heat in steam generated for the factory ..... %	60	68
Heat in steam generated for atomizing ..... %	3	1
Sensible heat of flue gases ..... %	27	23
Unburnt in flue gases ..... %	0	0
Unburnt in dust ..... %	0	1
Radiation and unaccountable ..... %	10	7
Total heat distribution ..... %	100	100

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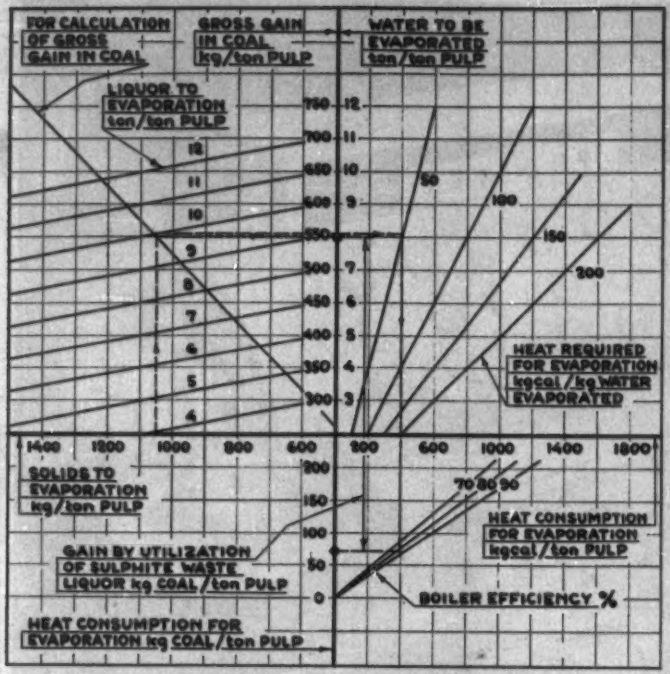
FOR CALCULATION OF GROSS GAIN IN COAL
GROSS GAIN IN COAL kg/ton PULP
LIQUOR TO EVAPORATION ton/ton PULP
WATER TO BE EVAPORATED ton/ton PULP
HEAT REQUIRED FOR EVAPORATION kgcal/kg WATER EVAPORATED
SOLIDS TO EVAPORATION kg/ton PULP
GAIN BY UTILIZATION OF SULPHITE WASTE LIQUOR kg COAL/ton PULP
HEAT CONSUMPTION FOR EVAPORATION kg COAL/ton PULP
HEAT CONSUMPTION FOR EVAPORATION kgcal/ton PULP
BOILER EFFICIENCY %

COMPUTATION OF GAIN IN COAL BY UTILIZATION OF SULPHITE WASTE LIQUOR

Figure 9

must be modified.

Experience gained from various waste liquor burnings in boilers has proved to be often contradictory and therefore bewildering. One point in common is that where ash-deposition occurs it is localized to the furnace, the forward part of main boiler-tube banks and the super-heater, whereupon the parts of the boiler assembly working at lower temperature are practically free from scale-formation.

Zinzen *(20)* has studied the question of ash deposition on boiler tubes, and prepared a long series of experiments with ash of various origins and conditions. The research has not included sulphite waste liquor, but ash from lignite which has been examined, exhibits, from the point of view of composition, great similarities to sulphite waste liquor. Zinzen states that the calcium sulphate and calcium sulphide formed by the combustion of lignite has, in a pure condition, a eutectic point at about 830° C. If, however, contamination of Fe_2O_3, SiO_2 and Al_2O_3 is present, the melting point can be increased up to 1200° C.

From this examination it is easy to draw the conclusions that the highest possible cooling of flue-gases before passage into the main tube banks and combustion of waste sulphite liquor together with other fuel, the ash of which contains oxides of iron and aluminum, would lead to diminished difficulties. This would appear to be in accordance with results obtained just now in Sweden from the point of view of ash deposition in the burning of sulphite waste liquor. When burning waste liquor together with pulverized coal in a modern boiler it has been found possible to maintain heating surfaces free from ash-building by normal soot-removal with the usual stationary soot-blower for air or steam.

In the question of the burning of waste liquor either alone or mixed with a low-ash fuel such as oil, it is necessary that the furnace be roomy and well equipped with wall-tubes. A spacing on wide centers of the tubes in the first part of the tube banks and a suspended super-heater help to minimize difficulties. If these conditions are not satisfied, in a few days the tubes and super-heater can be entirely ashed-up. The best previous known method to remove the ash appeared to be water-rinsing.

In many installations the boilers are very unsuitable for waste liquor burning. The cheapest solution of the burning problem should be a special waste liquor burning aggregate which, on the water side, is connected to an existing boiler so that the aggregate does not need to be equipped with a special boiler drum and fittings essential to such an installation. It would appear as if the burning of digester liquor with its lower ash content should be preferred to the burning of slop from the stripping columns which leaves a large amount of ash. Experience appears to strengthen this supposition without any definite conclusions being drawn.

Collectively it may be stated that, from the viewpoint of waste sulphite liquor burning and the results thereof it does not cause any great trouble. However difficulties with ash-deposition on the heating surfaces may occur which can lead to production hold-ups or expensive re-arrangement of boiler systems.

Concerned with waste liquor burning is the question of the higher dew-point of the flue-gases due to the presence of SO_3, a problem which has been already dealt with by the author *(21)*. Another significant point is the ash collecting and eventual detrimental effects due to the SO_2 content of the flue-gases *(22)*.

Calculation of Fuel Saving

With the help of the diagrams in *Figures 5-9*, the fuel saved through the evaporation and burning of waste liquor may be calculated fairly generally. In spite of certain approximations taken to avoid complications in the diagram, they may be used for normal saving calculations. The saving may be calculated for either cases where the waste liquor is directly evaporated, or, as is more usual in Sweden, a combination of an alcohol plant and evaporation installation.

Figure 5 is used to calculate the amount of solid matter in the evaporated liquor. This is based on the dry-substance content of the digester liquor from the cooking plant, which according to what has already been stated—dependent on pulp-quality — normally varies between 1000 and 1400 Kg per metric ton of pulp (air-dry). According to experiments in individual factories or from *Figures 2* and *3*, the dry-substance yield in the liquor recovery is known, from which may be calculated the solid content in the waste liquor. In the absence of an alcohol plant this is the same as the solid content in the evaporation plant liquor. If the waste liquor is used to produce alcohol, the solid content is reduced by a certain amount of fermentable sugars. Waste liquor contains about 20 percent sugar, somewhat more in rayon pulps less in strong pulps. By fermentation factor is meant the production of a "sugar yield" in neutralization, degree of fermentation and efficiency of fermentation calculated on the fermentable sugar. The fermentation factor varies from plant to plant but should lie betwen 0.75 and 0.90.

Starting from the dry content of the digester liquor in the sulphite cooking

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plant which may be easily determined, the amount of digester liquor in the cook may be calculated from *Figure 7*. From the u/f ratio, where u is the substance yield and f the concentration ratio (integral) the amount of waste liquor may be determined. When only liquor evaporation is concerned it is the amount of liquor conveyed to the evaporation plant.

In the production of alcohol the liquor is neutralized and fermented before entering the alcohol plant. No regard is paid in the diagram to neutralization which is usually carried out in Sweden by lime sludge from sulphate factories. Neutralization means an insignificant increase in the water-content of the liquor and a certain increase of inorganic substances without any significance whatsoever from the viewpoint of heat economy. In the fermentation plant a certain amount of the sugar ferments and carbon dioxide is lost. A correction has been made therefore, in the higher right-hand quadrant of *Figure 7*.

The curves in *Figure 8* may be used for the calculation from the amount of fermented liquor i.e. the amount of liquor to the alcohol factory, of the amount of liquor to the evaporation plant. Subject to the condition that the stripping column in the alcohol factory is equipped with an external heat exchanger in which the steam heat required for distillation is indirectly transferred to the liquor in the column, dilution of the liquor is avoided. Usually steam enters the stripping column directly and dilution is dependent on the steam consumption of the column. In return varying quantities of water are transferred to the rectifying column together with the alcohol thus diminishing the water content of the liquor. In *Figure 8* starting from values from an existing alcohol factory, the quantity of fermented liquor may be used to calculate the amount of liquor for the evaporation plant.

The diagram may be used in the case where only a certain part of the liquor is used in the alcohol plant while the rest is conveyed directly from the blowpits to the evaporation plant. This calculation is somewhat more complicated.

In *Figure 9* the left-hand upper quadrant may be used, together with figures from the previous diagram, to calculate the gross saving in coal effected by waste liquor burning. It is here assumed that the liquor is evaporated to a 55 percent dry content and has a temperature of about 100° C. The net calorific value of the liquor including sensible heat is then about 2000Gcal/Kg. (3500 BTU/lb). The net calorific value of coal has been assumed to be 6500 Kgcal/Kg. (11,700 BTU/lb.) It has been calculated in the diagram that 3.4 tons of thick liquor correspond to 1 ton of coal. This relationship is a somewhat higher ratio than that which is calculated directly on the heating values, being partly dependent on the waste liquor, due to its high water content, giving relatively large quantities of flue-gases such, as a rule, producing a somewhat lower boiler efficiency than coal. With the help of the upper left-hand quadrant in *Figure 9* also the amount of water evaporated in the evaporation plant may be calculated. In connection with the specific heat consumption of the evaporation in the upper right-hand quadrant, the total steam requirements of the evaporation plant may be calculated. A counter-pressure plant can generally be assumed to have a heat consumption of 50 Kgcal/Kg. (90 BTU/lb.) evaporated water, while a vacuum plant has a heat consumption of *750* Kgcal/Kg. (135 BTU/lb.) water, where n is the number of evaporation stages. These figures are given only for general guidance. As has already been stated, the secondary heating effects must not be ignored.

With the help of the lower right-hand quadrant in *Figure 9*, the steam requirements of the evaporation plant may be calculated in terms of coal and the diagram also shows the net fuel saving in Kg. of coal per metric ton of 90 percent pulp.

It would, naturally, have been very desirable in this connection to touch upon the installation and maintenance expenses in order to gauge the gain derived from an evaporation plant. Prices are, however, so unstable at the moment that such calculations would very quickly cease to be of any significance whatsoever.

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Sulfite Liquor As Fuel Extender

GREEN BAY, Wis. — Many a family in this area is burning an improved fuel this winter in space heaters, furnaces, and open fireplaces, unaware that it is helping to solve the sulphite pollution problem in Wisconsin streams and at the same time put to work a by-product of the coal docks. The new fuel blocks are the size of a common brick, are practically dustless, produce very little smoke or ash, and have about 25 percent greater heating value than ordinary coal. They are made by compressing small coal particles after mixing these with sulphite liquor which serves as a binder.

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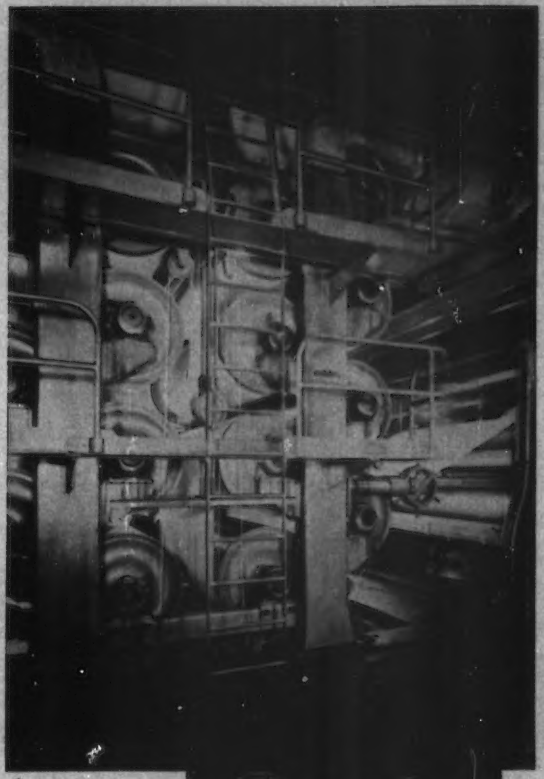
shipping grapefruit results from the joint efforts of Union Bag and the Atlantic Commission Company. Their solution took the form of a specially constructed bag made from 3 layers of wet strength paper. A series of perforations in the bag provide the necessary ventilation. As illustrated, the fruit arrives at destination in a condition that is comparable to fruit shipped in conventional containers.

Figures from last season's controlled shipments showed savings in container costs ranging from $47 to $75 per car. In addition, savings in freight charges were estimated at $13 to $16 per car. Savings vary, depending on quantities of bags used in each carload shipment.



Recently Installed Downingtown Dryer Stack

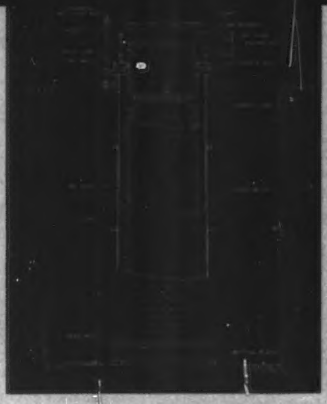


Diagram of the Downingtown Cement Bonded Sand Core Method

NEW PRECISION

IN DRYER ROLL MANUFACTURING

For precision casting of Dryer Rolls, Downingtown Engineers developed a revolutionary Cement Bonded Sand Core Method of casting shells. All shells thus cast are identical, distortions are eliminated and dimensional accuracy and uniformity are maintained. The interior of the shell is true and smooth and requires no boring. Also, the dryers are in balance and all balance weights are eliminated.

This Downingtown method of casting dryers serves the paper mills by uniform heat transfer and its attendant sheet drying efficiency at low steam requirements and through an operating range up to 150 lbs./inch pressure.

When considering new dryers or a complete dryer section let our sales engineers serve you.

DOWNINGTOWN MANUFACTURING COMPANY
DOWNINGTOWN, PA.
Pacific Coast Representative: John V. Rasland, Pacific Bldg., Portland 4, Oregon

DOWNINGTOWN
DRYER ROLLS

DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880

Bids and Awards

GPO 1st Quarter, 1952 Paper Needs

WASHINGTON — Bids were received on December 10 by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for a three-month period beginning January 1, 1952. Awards, announced December 20, are indicated by asterisks (*) before the names of the successful bidders in the tabulation herewith.

Newsprint

No. 1—1,800,000 lbs., 24x36—64; rolls, 19, 24, 36, 38 and 48 ins. wide, diameter, 34 ins. min., 36 ins. max. (3-inch fiber cores); also rolls, 1,600,000 lbs., 23, 34½ and/or 46 ins. wide, 38 inches in diameter, max. width, 40 ins. (returnable 3-inch iron or metal-capped fiber cores). Min. order, 40,000 lbs.

Machine-Finish Book

No. 3—750,000 lbs., 25x38—70; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.
* Mead Board Sales Co. ..... .13c
Mead Board Sales Co. (over 56 ins. in length) ..... .13c

No. 6—50,000 lbs., 25x38—70; rolls, 28½ ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
Mudge Paper Co. ..... .1347c
Mead Board Sales Co. ..... .1165c
* Wilcox Walker Furlong Co. ..... .1137c

No. 7—400,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
Mudge Paper Co. ..... .1347c
Mead Board Sales Co. ..... .1165c
* Wilcox Walker Furlong Co. ..... .1137c

No. 9—270,000 lbs., 25x38—70; rolls, 24, 36 and 48 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
Mudge Paper Co. ..... .1347c
* Wilcox Walker Furlong Co. .... .1137c
Mead Board Sales Co. ..... .1165c

English-Finish Book

No. 10—120,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins., max. length 36 ins.; min. order, 20,000 lbs.
Stanford Paper Co. ..... .1352c (Rejected)

Machine-Finish Book End Paper

No. 16—20,000 lbs., 25x38—160; flat, cut 38x50 ins., min. order, 20,000 lbs.

Offset Book

No. 18-18a—500,000 lbs., 25x38—100; flat, cut any size, and 8x10½ ins.; min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.
* Bermingham & Prosser Co. (160,000 lbs.) ..... .1323c
* Central Ohio Paper Co. (300,000 lbs.) ..... .1367c
Barton, Duer & Koch Paper Co. .1820c
* Bermingham & Prosser Co. (40,000 lbs.) ..... .1398c
Wilcox Walker Furlong Co. .... .1355c (Rejected)

No. 19-19a—110,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.
* Bermingham & Prosser Co. ..... .1323c

Antique Book

No. 21—100,000 lbs., 25x38—90; flat, cut 32x42, and 38x50; min. order, 40,000 lbs.
* Stanford Paper Co. ..... .1379c

No. 22—20,000 lbs., 25x38—120; flat, cut 32x42, 38x48, and 38x50 ins.; min. order, 20,000 lbs.
* Stanford Paper Co. ..... .1379c

50% Antique Book

No. 26—50,000 lbs., 25x38—80; flat, cut 32x48, and 38x48 ins.; min. order, 20,000 lbs.
Paper Corp. of U. S. ..... .2762c
Wilcox Walker Furlong Co. .... .2997c (Rejected)
* Walker, Goulard Plehn Co. ..... .2648c

No. 27—30,000 lbs., 25x38—80; shall be suitable for writing on with ink; flat, cut 22½x31 ins.; min. order, 30,000 lbs.
Paper Corp. of U. S. ..... .2762c
* Wilcox Walker Furlong Co. .... .2497c
Walker Goulard Plehn Co. ..... .2648c

Water Resistent (Text) Book

No. 30—250,000 lbs., 25x38—120; flat, cut 32x42 and 35x45 ins.; min. order, 40,000 lbs.
* Stanford Paper Co. ..... .1960c

Supercalendered Book

No. 32—60,000 lbs., 25x38—90; flat, cut any size; min. width 24 ins., max. width 48 ins.; min. order, 40,000 lbs.
* Mead Board Sales Co. ..... .1310c
* Mead Board Sales Co. (over 56 ins. in length) ..... .1310c

No. 33—550,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
Mudge Paper Co. ..... .1311c
Mead Board Sales Co. ..... .1185c
* R. P. Andrews Paper Co. 8.48c

Coated Book

No. 34—1,650,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.; min. order, 40,000 lbs.
* Mead Board Sales Co. (120,000 lbs.) ..... .1340c
Garrett Buchanan Co. ..... .234c
* R. P. Andrews Paper Co. (480,000 lbs.) ..... .1214c
* Frank Parsons Paper Co. (450,000 lbs.) ..... .1230c
* Walker Goulard Plehn Co. (600,000 lbs.) ..... .1325c

No. 38—170,000 lbs., 25x38—140; flat, cut 32x42, 38x48 and 39x50 ins. and 42x64 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.
* Bermingham & Prosser Co. ..... .1558c
Barton, Duer & Koch Paper Co. .1575c
Stanford Paper Co. ..... .1636c
Frank Parsons Paper Co. ..... .1565c
Frank Parsons Paper Co. ..... .1620c

Goldenrod Coated Book

No. 37—3,000 lbs., 25x38—160; flat, cut 38x50 and 42x58 ins.; min. order, 2,000 lbs.
Whitaker Paper Co. ..... .2231c
Mudge Paper Co. ..... .2231c
* Bermingham & Prosser Co. ..... .2060c
Stanford Paper Co. ..... .2490c
Frank Parsons Paper Co. ..... .2170c

Litho Coated Book

No. 41—180,000 lbs., 25x38—140; flat, cut 32x42, 35x45, 38x48, 39x50, and 41x52 ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.
Mudge Paper Co. ..... .1691c
Paper Corp. of U. S. ..... .1693c
R. P. Andrews Paper Co. ..... .1693c
Wilcox Walker Furlong Co. ..... .1725c
Stanford Paper Co. ..... .1712c
Frank Parsons Paper Co. ..... .1705c
Old Dominion Paper Co. ..... .1690222c
* Walker Goulard Plehn Co. ..... .1678c

Chemical Wood Mimeographed White and Colored

No. 44—1,150,000 lbs., white, No. 40; flat, cut 28½x34½, 32½x42½, 38x48½, 8 x 10½ ins. Grain size 28½x34½ ins. to run the 28½ inch way; size 32½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way; min. order, 40,000 lbs.
* Butler Paper Co. ..... .1293c
Boston Paper Co. ..... .1730c
Barton, Duer & Koch Paper Co. .1325c

No. 45—55,000 lbs., blue, buff, green, pink and yellow, No. 40; flat, cut 32½x42½, and 38x48½ ins. Grain; size 32½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way. Min. order, one color, 10,000 lbs.

25% Mimeograph

No. 46—560,000 lbs., No. 40; flat, cut 28½x34½, 32½x42½, 38x48½, 8x10½ ins. Grain: size 28½x34½ ins. to run the 28½ inch way; size 32½x42½ ins. and 40½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way; min. order, 40,000 lbs.
Whitaker Paper Co. 20.14c
R. P. Andrews Paper Co. 20.14c
* Walker Goulard Plehn Co. 19.89c
* Walker Goulard Plehn Co. ..... 19.19c (100,000 lbs. only—Balance not required)
Whitaker Paper Co. 21.49c
R. P. Andrews Paper Co. 21.49c
Cauthorne Paper Co. 21.49c
Cauthorne Paper Co. 21.14c

Duplicator Copy Paper Liquid Process, White and Colored

No. 47a—700,000 lbs., white; No. 40; flat, cut 8x10½, 32x42, 34x44 and 40x52½ ins.; the grain to run lengthwise of the sheet; min. order, 40,000 lbs.
* Walker Goulard Plehn Co. (350,000 lbs.) 16.43c
Walker Goulard Plehn Co. ..... .1718c

No. 48a—30,000 lbs., pink, yellow, green and blue, No. 40; flat, cut 32x42, 34x44 and 40x52½ ins.; the grain to run lengthwise of the sheet; min. order, 20,000 lbs.

Chemical Wood Writing White and Colored

No. 51-51a—100,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.

No. 52-52a—3,250,000 lbs., white, No. 32; flat, cut any size, and 8x10½ ins.; min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.
* R. P. Andrews Paper Co. (2,040,000 lbs.) 13.23c
Walker Goulard Plehn Co. ..... .1740c

No. 53-53a—4,500,000 lbs., white, No. 40; flat, cut any size, and 8x10½ ins.; min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.
* Frank Parsons Paper Co. (500,000 lbs.) 13.60c
* Barton, Duer & Koch Paper Co. (500,000 lbs.) 13.60c
* Mead Board Sales Co. (500,000 lbs.) 13.50c
* R. P. Andrews Paper Co. (900,000 lbs.) 12.64c
* Whitaker Paper Co. (1,200,000 lbs.) 13.35c

No. 54-54a—600,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 48 ins., diameter, 34 ins. min., 36 ins. max. (3-inch fiber cores); also rolls, 23, 34½, 44 and/or 46 ins., max. width 40 ins., 38 ins. in diameter (returnable 3-inch iron or metal-capped fiber cores); min. order, 40,000 lbs.
Mead Board Sales Co. ..... .1285c
Frank Parsons Paper Co. ..... .1285c
* R. P. Andrews Paper Co. (600,000 lbs.) 11.76c

No. 55-55a—170,000 lbs., white, No. 40; rolls, min. width 16 ins., max. width 48 ins., diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); also rolls, 23, 34½, 44 and/or 46 ins., max. width 40 ins., 38 ins. in diameter (returnable 3-inch iron or metal-capped fiber cores); min. order, 40,000 lbs.
Mead Board Sales Co. ..... .1225c
* R. P. Andrews Paper Co. 11.17c

No. 56-56a—80,000 lbs., blue, buff, green, pink, salmon and yellow, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.

No. 57-57a—330,000 lbs., blue, buff, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.

No. 58-58a—300,000 lbs., blue, buff, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.

No. 60—100,000 lbs., yellow, No. 32; rolls, 38 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores).

No. 62—50,000 lbs., white, No. 30; rolls, 22 ins. wide, diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 20,000 lbs.
* Mead Board Sales Co. ..... .1310c

No. 63—40,000 lbs., blue, green, pink, yellow, buff, cherry and salmon, No. 24; rolls, 22 ins. wide, diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, one color, 10,000 lbs.

White Chemical Wood Writing

No. 64—40,000 lbs., No. 32; rolls, 38 ins. wide, diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
* Mead Board Sales Co. ..... .1285c

50% Lithograph-Finish Map

No. 70—10,000 lbs., No. 32; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .2959c
Stanford Paper Co. ..... .3167c

No. 71—50,000 lbs., No. 40; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .2959c
Stanford Paper Co. ..... .3016c

No. 73—72,500 lbs., No. 56; flat, cut any size min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
Paper Corp. of U. S. ..... .2989c
* Stanford Paper Co. 29.65c

High Wet Strength Map

No. 78—444,000 lbs., No. 48; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet, unless otherwise specified (omit ream markers); min. order, 10,000 lbs.
Paper Corp. of U. S. ..... .2565c
Stanford Paper Co. ..... .2523c
* Walker Goulard Plehn Co. ..... .2295c

50% White Chart, Lithograph-Finish

No. 79—233,000 lbs., No. 72; flat, cut any size, min. width 22 ins.; max. width 46 ins.; the grain to run lengthwise of the sheet, unless otherwise specified (omit ream markers); min. order, 10,000 lbs.

* Stanford Paper Co. 32.39c
Paper Corp. of U. S. ..... .2897c
Stanford Paper Co. ..... .3215c
(Rejected)
Walker Goulard Plehn Co. ..... .3215c
(Rejected)

Chemical Wood Manifold White and Colored

No. 85—110,000 lbs., white, No. 18; flat, cut 8x10½, 21x32, 28x34, 32x42, and 34x44 ins.; min. order, 10,000 lbs.

Walker Goulard Plehn ..... .2222c
Walker Goulard Plehn Co.
(per M sheets) $1.02
* Frank Parsons Paper Co. 20.55c
* Frank Parsons Paper Co. 23.10c

No. 85—55,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 28x34, 32x42, and 34x44 ins.; min. order, one color, 5,000 lbs.

Mead Sales Co. ..... .1340

50% Manifold, White and Colored

No. 86—10,000 lbs., white, No. 14; flat, cut 32x42 ins.; min. order, 10,000 lbs.

* Stanford Paper Co. 5564c
Ecusta Paper Corp. ..... .525
No. 87—40,000 lbs., white, No. 18; flat, cut 8x10½, 21x32, 28x34, 32x42, and 34x44 ins.; min. order, 10,000 lbs.
* Paper Corp. of U. S.
(20,000 lbs.) ..... .4515c
Stanford Paper Co. ..... .4494
Ecusta Paper Corp. ..... .445
Walker Goulard Plehn Co. ..... .41
Walker Goulard Plehn Co. ..... .4175
Paper Corp. of U. S. ..... .4983
* R. P. Andrews Paper Co.
(20,000 lbs.) ..... .4472c

No. 89—30,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 28x34, 32x42, and 34x44 ins.; min. order, one color, 5,000 lbs.

Paper Corp. of U. S. ..... .4811
* Barton, Duer & Koch Paper Co. ..... .4700c

50% White Glazed Manifold

No. 91—40,000 lbs., No. 16; flat, cut 32x42 ins.; min. order, 20,000 lbs.

Paper Corp. of U. S. ..... .4950
Ecusta Paper Corp. ..... .485
* Barton, Duer & Koch Paper Co. ..... .4875c

Chemical Wood Bond, White

No. 102—100,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.

* R. P. Andrews Paper Co.
(both lengths) ..... .1510c

Chemical Wood White Mimeograph Bond

No. 104—100,000 lbs., No. 40; flat, cut 32½x42½ ins.; the grain to run lengthwise of the sheet; min. order, 20,000 lbs.

* R. P. Andrews Paper Co. ..... .1510c
No. 105—40,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, 10,000 lbs.
Paper Corp. of U. S. ..... .2930
* Barton, Duer & Koch Paper Co. ..... .2925c

25% Bond, White and Colored

No. 107—800,000 lbs., white, No. 32; flat, cut any size, and cut size 8x10½ ins., min. width 21 ins., max. width 48 ins.; min. order, 40,000 lbs.

* Paper Corp. of U. S.
(both lengths) ..... .2362c
Paper Corp. of U. S. ..... .2696c
Butler Paper Co. ..... .2820
Howard Paper Mills (Aetna Div.) .2406c
* Howard Paper Mills (Aetna Div.) .2504c
No. 109—900,000 lbs., No. 40; flat, cut any size, and cut size 8x10½ ins., min. width 21 ins., max. width 48 ins.; min. order, 20,000 lbs.
Mudge Paper Co. ..... .3305
* Paper Corp. of U. S.
(400,000 lbs. both lengths) ... .2262c
* Howard Paper Mills (Aetna Div.)
(300,000 lbs. both lengths) ... .2308c
Howard Paper Mills (Aetna Div.) .2406
Frank Parsons Paper Co. ..... .2410
Walker Goulard Plehn Co. ..... .2337
Paper Corp. of U. S. ..... .3585
No. 110—60,000 lbs., No. 32; rolls, 21, 22, and 26 ins. wide; diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 20,000 lbs.
* Paper Corp. of U. S. ..... .2311c
No. 112—50,000 lbs., medical forms pink, green, yellow, cherry, No. 32; rolls, 26 ins. wide; diameter 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .2411c
No. 114—230,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.
* Paper Corp. of U. S. ..... .2462c
Howard Paper Mills (Aetna Div.) .2504c
No. 115—50,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.; min. order, one color, 10,000 lbs.
* Paper Corp. of U. S. ..... .2362c
Howard Paper Mills (Aetna Div.) .2406c

25% Opacified Bond Paper

No. 116—30,000 lbs., buff, No. 32; cut 41x56 ins., grain long; min. order, 20,000 lbs.
* Barton, Duer & Koch Paper Co. . .2700c
Paper Corp. of U. S. ..... .2765

50% White Bond

No. 122—15,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.; min. order, 10,000 lbs.
* Barton, Duer & Koch Paper Co. . .2840c
Paper Corp. of U. S. ..... .2855
Howard Paper Mills (Aetna Div.) .2857c

100% White Bond

No. 130—10,000 lbs., No. 40; flat, cut any size, min. width, 16 ins., max. width 38 ins.; min. order, 2,000 lbs.
* Paper Corp. of U. S. ..... .4885c
Walker Goulard Plehn Co. ..... .4950

Chemical Wood White Ledger

No. 150—160,000 lbs., No. 48; flat, cut any size, min. width 17 ins., max. width 48 ins.; min. order, 20,000 lbs.
* R. P. Andrews Paper Co. ..... .1610c
No. 151—120,000 lbs., No. 64; flat, cut any size, min. width 17 ins., max. width 48 ins.; min. order, 10,000 lbs.
* R. P. Andrews Paper Co. ..... .1610c
No. 153—15,000 lbs., No. 88; flat, cut any size, min. width 17 ins., max. width 48 ins.; min. order, 10,000 lbs.

25% Ledger, White and Colored

No. 154—150,000 lbs., white, No. 48; flat, cut 28x34, 32x42, 34x44, and 38x48 ins.; min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .24c
Howard Paper Mills (Aetna Div.) .2406c
No. 155—60,000 lbs., white, No. 64; flat, cut 28x34, 32x42, 34x44, and 38x48 ins.; min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .24c
Howard Paper Mills (Aetna Div.) .2406c
No. 156—30,000 lbs., white, No. 88; flat, cut 28x34, 32x42, 34x44, and 38x48 ins.; min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .2465c
No. 157—20,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 64; flat, cut 34x44 ins.; min. order, one color, 10,000 lbs.
* Paper Corp. of U. S. ..... .2565c
No. 158—40,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 88; flat, cut 34x44 ins.; min. order, one color, 10,000 lbs.
* Paper Corp. of U. S. ..... .2565c

100% White Ledger

No. 177—20,000 lbs., No. 64; flat, cut 28x34, 32x42, and 34x44 ins.; min. order, 10,000 lbs.
Paper Corp. of U. S. ..... .5015
Central Ohio Paper Co. ..... .4975
Walker Goulard Plehn Co. ..... .5050
* Barton, Duer & Koch Paper Co. . .4935c

Chemical Wood, White and Colored Index

No. 182—80,000 lbs., white, 25½x30½—220; flat, cut 32x42 and 34x44, and 39x50 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Whitaker Paper Co. ..... .1625c
Stanford Paper Co. ..... .1875
Old Dominion Paper Co. ..... .148111
Old Dominion Paper Co. ..... .6472
* Frank Parsons Paper Co. ..... .11875c
No. 183—20,000 lbs., single-ply, 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Whitaker Paper Co. ..... .1625
* Old Dominion Paper Co. ..... .151231c
No. 185—120,000 lbs., buff, single-ply, 25½x30½—220; flat, cut 32x42 ins., with projecting colored-paper marker between each 100 sheets; min. order, 20,000 lbs.
* Whitaker Paper Co. ..... .1340c
Old Dominion Paper Co. ..... .158198

50% Index, White and Colored

No. 188—200,000 lbs., white, 25½x30½—220, flat, cut 32x42, 32x48 and 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Paper Corp. of U. S. ..... .2610
Walker Goulard Plehn Co. ..... .2767
* Frank Parsons Paper Co. ..... .2430c
No. 189—20,000 lbs., white, 25½x30½—280; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
Paper Corp. of U. S. ..... .2610
Walker Goulard Plehn Co. ..... .2847
* Frank Parsons Paper Co. ..... .2480c
No. 191—130,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow; 25½x30½—320; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, one color, 10,000 lbs.
Paper Corp. of U. S. ..... .2710
Walker Goulard Plehn Co. ..... .2867
* Frank Parsons Paper Co. ..... .2530c
No. 192—15,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow; 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets; min. order, one color, 10,000 lbs.
Paper Corp. of U. S. ..... .2710
* Frank Parsons Paper Co. ..... .2580c
Walker Goulard Plehn Co. ..... .2947

100% White Index

No. 196—50,000 lbs., 25½x30½—250; flat, cut 20¼x30 ins.; min. order, 20,000 lbs.
Paper Corp. of U. S. ..... .4785
Walker Goulard Plehn Co. ..... .5015
* Barton, Duer & Koch Paper Co. . .4775c

Coated Cover, White and Colored

No. 200—10,000 lbs., white, 20x26—120; flat, cut 26½x41 and 34x44 ins.; the grain to run lengthwise of the sheet; min. order, 10,000 lbs.
* Bermingham & Prosser Co. ..... .1658c
No. 201—10,000 lbs., india tint and light green; 20x26 ins.—120; flat, cut 26½x41 ins.; min. order, 10,000 lbs.
* Bermingham & Prosser Co. ..... .1828c
* Bermingham & Prosser Co. ..... .1788c

Antique-Finish Cover, White and Colored

No. 202—60,000 lbs., 20x26—100; flat, cut 25¼x39 ins.; min. order, 20,000 lbs.
* R. P. Andrews Paper Co. ..... .1545c
Whitaker Paper Co. ..... .1475
Mead Sales Co. ..... .1475
Old Dominion Paper Co. ..... .160662c
No. 203—50,000 lbs., 20x26—100; blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea, and canary; flat, cut 25¼x39 ins.; min. order, one color, 10,000 lbs.
Whitaker Paper Co. ..... .35400
Mead Sales Co. ..... .1475
(Rejected)

Cloth Lined Cover, White and Colored

No. 205—5,300 sheets, white; facing paper, 20x26—72; flat, cut 28x40½ ins.; min. order, 5,000 sheets.
* Stanford Paper Co.
(per M sheets) $352.80
No. 205—5,000 sheets, brown or quaker drab; facing paper, 20x26—72; flat, cut 36x38 ins.; min. order, 5,000 sheets.
* Whitaker Paper Co.
(per M sheets) $354.00

50% Laid Cover, Colored

No. 206—60,000 lbs., blue, cream, white, gray and green; 20x26—130; flat, cut 25¼x39 and 28x41 ins.; the laid lines to run the short direction of the sheet; min. order, one color, 2,000 lbs.
* Frank Parsons Paper Co.... .2670c per lb.

Wood Manila

No. 208—150,000 lbs., 24x36—80; flat, cut 25x38, 32x42, and 40x52½ ins.; min. order, 20,000 lbs.
Whitaker Paper Co. ..... .1967
* Frank Parsons Paper Co. ..... .1083c per lb.
Mead Sales Co. ..... .0967

Chemical Wood Manila

No. 213—20,000 lbs., 24x36—140; flat, cut 32x42 ins.; min. order, 10,000 lbs.

Drumhead Manila

No. 217—10,000 lbs., 24x36—280; flat, cut 32x42 ins.; min. order, 5,000 lbs.
Paper Corp. of U. S. ..... .3450
* R. P. Andrews Paper Co. .... .3350c per lb.

No. 2 Kraft

No. 218—20,000 lbs., 24x36—80; flat, cut any size; max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.
* Cauthorne Paper Co.
(20,000 lbs.) ..... .998c
No. 218—25,000 lbs., 24x36—100; flat, cut any size; max. length 56 ins., in bundles wrapped and tied; min order, 10,000 lbs.
* Cauthorne Paper Co.
(25,000 lbs.) ..... .973c

No. 218—10,000 lbs., 24x36—120; flat, cut any size; max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.
* Cauthorne Paper Co.
(10,000 lbs.) ..... .973c

No. 218—35,000 lbs., 24x36—140; flat, cut any size; max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.
* Cauthorne Paper Co.
(35,000 lbs.) ..... .973c

No. 218—15,000 lbs., 24x36—160; flat, cut any size; max. length 56 ins., in bundles wrapped and tied; min. order, 10,000 lbs.
* Cauthorne Paper Co.
(15,000 lbs.) ..... .973c

No. 219—5,000 lbs., 24x36—80; cut any size, folded (25 sheets per fold), in wrapped bundles; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(10,000 lbs.) ..... .1061c

No. 219—10,000 lbs., 24x36—120; cut any size, folded (25 sheets per fold), in wrapped bundles; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(5,000 lbs.) ..... .1061c

No. 219—5,000 lbs., 24x36—160; cut any size, folded (25 sheets per fold), in wrapped bundles; min. order, 5,000 lbs.

No. 220—60,000 lbs., 24x36—70/80; 9 and 11 ins. wide, min. 22 ins., max. 24 ins. in diameter; rolls, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(60,000 lbs.) ..... .1023c

No. 220—60,000 lbs., 24x36—70/80; 12½ ins. wide, min. 21 ins., max. 22 ins. in diameter; rolls, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(60,000 lbs.) ..... .998c

No. 220—20,000 lbs., 24x36—100; 36 and 48 ins. wide, min. 28 ins., max. 30 ins. in diameter; rolls, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(20,000 lbs.) ..... .923c

No. 220—30,000 lbs., 24x36—120; 36 and 48 ins. wide, min. 28 ins., max. 30 ins. in diameter; rolls, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(30,000 lbs.) ..... .923c

No. 220—5,000 lbs., 24x36—140; 36 and 48 ins. wide, min. 28 ins., max. 30 ins. in diameter; rolls, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(5,000 lbs.) ..... .923c

No. 220—10,000 lbs., 24x36—160; 36 and 48 ins. wide, min. 28 ins., max. 30 ins. in diameter; rolls, wound on wooden plugs 1½-inch hole, or on 3-inch fiber core as may be specified with the order; min. order, 5,000 lbs.
* Cauthorne Paper Co.
(10,000 lbs.) ..... .923c

White Gummed

No. 252—250,000 sheets (ungummed), No. 36; flat, cut 22x34 ins.; min. order, 25,000 sheets.
Whitaker Paper Co. $23.50
Mudge Paper Co. $23.25
Bermingham & Prosser Co. .. $23.20
Eureka Specialty Co. $27.75
Butler Paper Co. $24.20
* Bulkley Dunton & Co.
(per M sheets) $22.48
Stanford Paper Co. $24.80
Old Dominion Paper Co. $23.9024

25% Blotting, White

No. 254—10,000 lbs., 19x24—160; flat, cut 19x24 ins., in wrapped bundles; min. order, 10,000 lbs.
Whitaker Paper Co. ..... .19c
Butler Paper Co. ..... .2140
Garrett Buchanan Co. ..... .20
Old Dominion Paper Co. ..... .206886
* R. P. Andrews Paper Co. ..... 19c per lb.

High-Finish Chemical Wood Manila Tag

No. 271—25,000 lbs., 24x36—280; flat, cut 28x34 and 38x48 ins.; min. order, 20,000 lbs.
Whitaker Paper Co. ..... .15485
* Paper Corp. of U. S. ..... .12c per lb.

Jute Tag

No. 280—20,000 lbs., 22½x28½—200; flat, cut 34x44 ins.; min. order, 10,000 lbs.
Paper Corp. of U. S. ..... .2190
* R. P. Andrews Paper Co. .... .2150c per lb.

Manila Board

No. 282—20,000 lbs., 22½x28½—400; flat, cut 22x34 ins., with projecting colored-paper marker between each 100 sheets; min. order, 10,000 lbs.
* Paper Corp. of U. S. ..... .1075c

White Litho-Coated One-Side Cardboard

No. 301—50,000 sheets; white, flat, 22x34 ins., 4-ply, each 100 sheets fully banded; min. order, 10,000 sheets.
Whitaker Paper Co. $60.00
Walker Goulard Plehn Co..... $58.49
* Barton, Duer & Koch Paper Co.
(per M sheets) $58.25

Railroad Board, White and Colored

No. 304—10,000 sheets, ash gray, green, orange, and red; flat, 22x34 ins., 4-ply, each 100 sheets fully banded; min. order, one color, 5,000 sheets.
Whitaker Paper Co. $52.00
* Walker Goulard Plehn Co.
(per M sheets) $65.00

No. 305—7,000 sheets; buff, flat, 22x28 ins., 14-ply, each 50 sheets fully banded; min. order, 5,000 sheets.
* Barton, Duer & Koch Paper Co.
(per M sheets) $143.20

Wood Cardboard, Colored

No. 306—200,000 lbs., buff, 22½x28½—150; rolls, 20 and 23 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, 40,000 lbs.
* Frank Parsons Paper Co. ..... .990c per lb.

No. 307—25,000 lbs., buff, 22½x28½—150; flat, cut 32x42 ins.; min. order, 20,000 lbs.
Walker Goulard Plehn Co. ..... .1175

No. 308—10,000 lbs., melon, 22½x28½—184; flat, cut 20x30 ins.; min. order, 10,000 lbs.

No. 309—40,000 lbs., blue, buff, green, melon, pink and yellow; 22½x28½—184; rolls, 20 ins. wide, 34 ins. min., 36 ins. max. (3-inch fiber cores); min. order, one color, 20,000 lbs.

Chemical Wood Tan Board

No. 316—60,000 lbs., 22½x28½—200; flat, cut 25x38, 28x38, and 34x44 ins.; min. order, 10,000 lbs.
Whitaker Paper Co. ..... .15825
(not required)
Paper Corp. of U. S. ..... .1695
(not required)

United States Postal Card Paper

No. 325—5,000,000 lbs., 22½x28½—188; rolls, 33 ins. wide, diameter 34 ins. min., 36 ins. max. (6-inch iron or metal capped returnable fiber cores); min. order, 40,000 lbs.
* Whitaker Paper Co.
(2,000,000 lbs.) ..... .1040c per lb.
* Frank Parsons Paper Co.
(1,200,000 lbs.) ..... .950c per lb.
Old Dominion Paper Co. ..... .129999
* R. P. Andrews Paper Co.
(1,800,000 lbs.) ..... .951c per lb.

No. 327—60,000 lbs., 22½x28½—188; rolls, 22 ins. wide, diameter 34 ins. min., 36 ins. max. (6-inch iron or metal capped returnable fiber cores); min. order, 40,000 lbs.
* Whitaker Paper Co. ..... .1040c
Old Dominion Paper Co. ..... .129995

Pressboard, Colored

No. 351—6,000 sheets; red, flat, cut 30x36 ins., thickness .0140 in.; min. order, 5,000 sheets.
* R. P. Andrews Paper Co.
(per C sheets) $17.97

Newsboard

No. 360—170,000 lbs., 26x38; No. 100; flat, cut any size, min. width 21 ins., max. width 40 ins. (To be guillotine-trimmed square on four sides.) Min. order, 10,000 lbs.
Mudge Paper Co. ..... .0530c
* Paper Corp. of U. S. ..... .0525c per lb.
Stanford Paper Co. ..... .0535
Old Dominion Paper Co. ..... .53425

Binder's Board, No. 1 Quality

No. 366—50,000 lbs., No. 1, 25¼x30¼ ins., Nos. 16, 18, 20, 25, 30, and 40; flat, to trim 25x30 ins.; min. order, 5,000 lbs.
Mudge Paper Co. ..... .0681
* R. P. Andrews Paper Co. ..... .670c per lb.

No. 367—45,000 lbs., No. 1, 25¼x30¼ ins., Nos. 12 and 20; flat, to trim 34x44 ins.; min. order, 5,000 lbs.
Mudge Paper Co. ..... .0681
* R. P. Andrews Paper Co. .... .670c per lb.

Chestnut Cover Board

No. 370—30,000 lbs., 25¼x30¼ ins., Nos. 16, 19, 24 and 31; flat, to trim 25¼x37¼ ins.; min. order, 20,000 lbs.
* Mead Sales Co. ..... .072c
Mead Sales Co. ..... .07195
Mead Sales Co. ..... .068
* Mead Sales Co. ..... .06825c

The South is Growing Fast

The growth of the pulp and paper industry since 1949 is dramatically demonstrated by the following report: cent above 1949, and 9.5 percent above the previous record year of 1948. The production of pine pulpwood was 11,-

Table I

Pulpwood production in the South by State and species group, 1949 and 1950

State	Percent change from 1949	1950 Total	1950 Pine	1950 1/ Hardwood	1949 Total	1949 Pine	1949 2/ Hardwood
		Thousand cords					
Ala.	+45.0	1,321.2	1,313.4	7.8	911.3	892.9	18.4
Ark.	+ 7.6	603.7	542.3	61.4	561.3	508.2	53.1
Fla.	+33.6	1,384.7	1,384.5	.2	1,036.1	1,034.4	1.7
Ga.	+24.1	2,221.3	2,120.8	100.5	1,790.5	1,668.9	121.6
La.	+16.3	883.3	825.5	57.8	759.8	726.1	33.7
Miss.	+42.7	1,665.9	1,388.8	277.1	1,167.7	1,028.2	139.5
N.C.	+27.7	1,024.0	790.4	233.6	802.1	620.2	181.9
Okla.	+ 2.4	38.8	38.8	...	37.9	37.8	.1
S.C.	+16.8	1,182.4	1,068.6	113.8	1,012.2	913.5	98.7
Tenn.	- 8.9	144.0	45.8	98.2	158.1	59.7	98.4
Texas	+16.6	922.3	376.4	45.9	790.9	749.7	41.2
Va.	+16.6	1,044.1	775.1	269.0	895.2	705.3	189.9
All	+25.3	12,435.7	11,170.4	1,265.3	9,923.1	8,944.9	978.2

1/ Includes 153,700 cords of chestnut used for pulp.
2/ Includes 169,500 cords of chestnut used for pulp.

In 1950 pulpwood production in the South rose to an all-time high of 12,-435,700 cords, an increase of 25.3 per- 170,400 cords, of hardwood 1,111,600 cords, and of dead chestnut 153,700 cords. Pine production was 24.9 per-

FREE

From Western Precipitation—the organization that pioneered the commercial application of Cottrell Precipitation...

IF YOU ARE ENGAGED in any phase of industry where the recovery of dusts, fumes, fly ash, mists, fogs or other suspensions from gases is a problem, you will find this booklet on the COTTRELL Electrical Precipitator helpful and informative.

Western Precipitation pioneered and installed the first commercial application of the well-known COTTRELL Electric Precipitator—Dr. Cottrell, the inventor, being a member of the company. And for more than 42 years Western Precipitation has consistently led in developing new COTTRELL advancements and techniques for recovering suspensions from gases, both wet and dry.

This 28 page booklet summarizes many of the basic facts you should know about modern COTTRELL Precipitators—the various types available, how they operate, principal types of electrode systems and rectifiers, shell constructions, etc. As long as the supply lasts, a free copy will be sent you on request to our nearest office. Ask for Bulletin No. C 103.

Packed with helpful COTTRELL Information!

This Western Precipitation Cottrell booklet is designed to answer questions of design engineers, plant engineers and others interested in applying Precipitators to the recovery of industrial dusts and mists. It discusses such subjects as . . .

- Basic types of Cottrell Electric Precipitators.
- Principal parts of a Cottrell Precipitator.
- Mechanical and Electronic Rectifiers.
- Various types of Collecting Electrodes (rod curtains, corrugated plates, duel plates, pocket electrodes, etc.).
- Removal of Collected Material.
- Factors in Shell Construction (steel, concrete, brick, etc.).
- Operating Efficiencies and the Effect of Various Factors on Performance.

. . . and many other basic Cottrell facts. Write for your free copy of Bulletin C103 today while supplies are adequate!

Western Precipitation is not affiliated with any other company in the field of electrical precipitation except its wholly owned subsidiaries, International Precipitation Corporation and the Precipitation Company of Canada, Ltd. Whether you are now contemplating the installation of a Cottrell Electrical Precipitator, or may be interested in such an installation at a future date, we can and will serve you in any part of the United States or other countries.

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COTTRELL Precipitators
MULTICLONE Collectors
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Scott Paper Company

CHECKS STREAM POLLUTION

with the help of Taylor Control

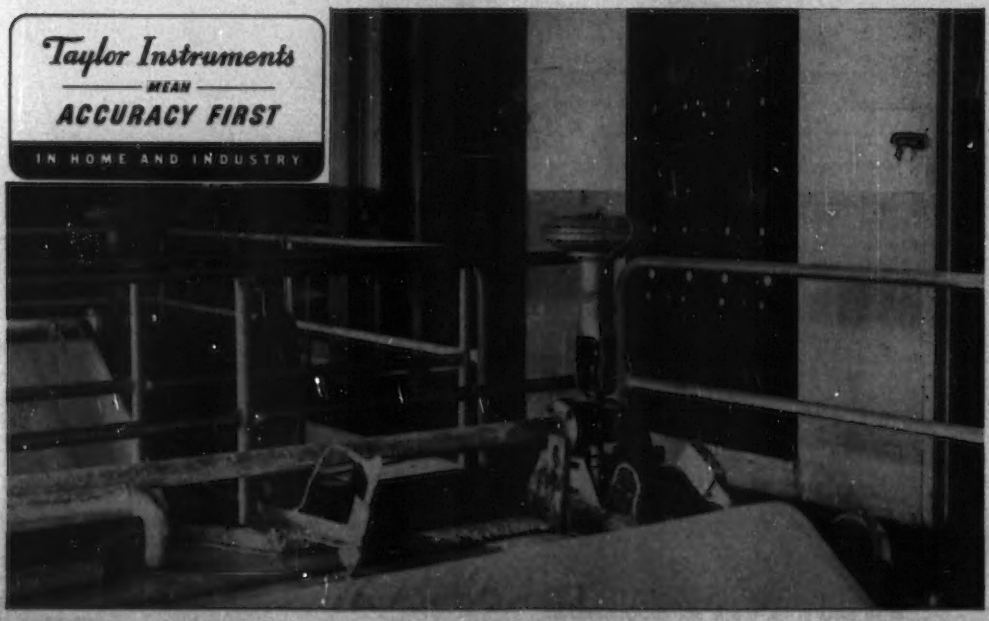
Taylor Controls on Scott Paper Company's new waste control system at their Chester, Pa., Mill are helping Scott make a significant contribution to the Pennsylvania Clean Streams Program. Under automatic control, the plant treats a substantial portion of the mill's discharged 7,000,000 gallons of water a day. More than 90% of the fibre is recovered from an aqueous slurry of only .02% pulp fibre.

The equipment used is an advanced type of precoat filter manufactured by Improved Paper Machinery Company of Nashua, N. H., which does not require chemicals for coagulation and settling, but does require precise control of flow and liquid level in many phases of the operation. The consulting engineers were Chas. T. Main, Inc.

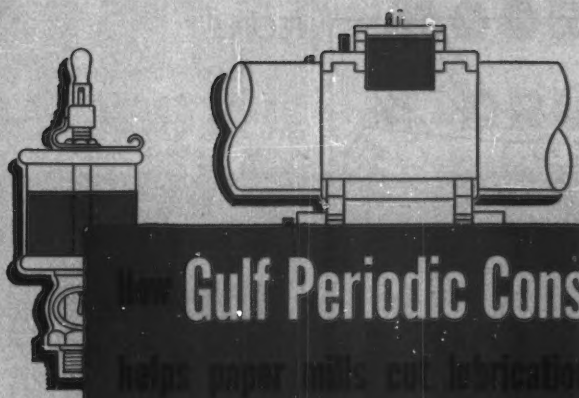
Taylor Instruments have kept the equipment operating at peak efficiency for an average of 23.9 hours a day over a six month period. The one and a half tons of stock recovered daily only partially offsets the operating costs of the plant. The real benefit goes to the communities downstream.

There are Taylor Instruments to bring peak efficiency to almost every operation in a paper mill . . . ask your Taylor Field Engineer, or write, Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.*

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY



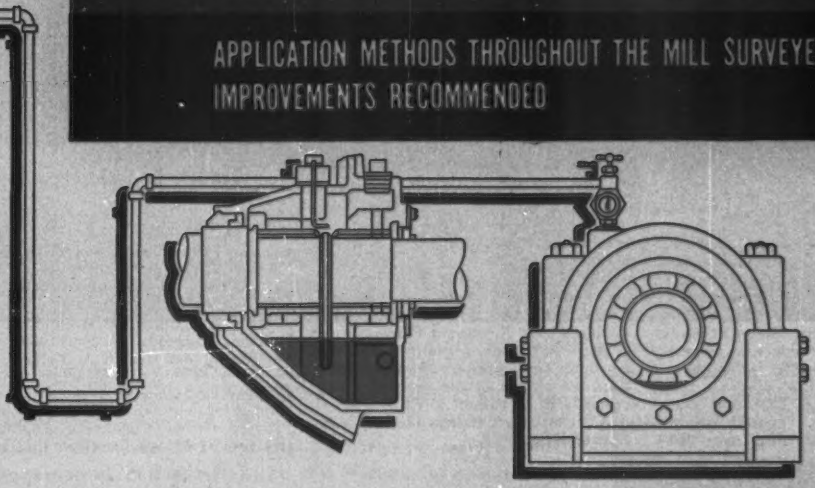
NUMBER 1 OF A SERIES



New Gulf Periodic Consultation Service

helps paper mills cut lubrication and maintenance costs

APPLICATION METHODS THROUGHOUT THE MILL SURVEYED. IMPROVEMENTS RECOMMENDED



A logical source of information and help on any problem that involves lubricants or lubrication is a trained Gulf Lubrication Engineer. You'll find he does more than simply recommend the proper oils and greases for your equipment. He offers help on every phase of the lubrication problem, on every type of equipment.

When he initially surveys your machinery, for example, he keeps an experienced eye on the suitability of various applicators and systems which supply the oils and greases. The chances are good that some of this equipment in your mill could and should be improved.

For example, are your dryer roll bearings block-grease lubricated? If so, the savings in power and bearing replacement costs may make a change to oil lubrication desirable. Or perhaps there's room for improvement in the method of applying oil to your dryer roll bearings. How is grease applied to your beater bearings—in large-volume slugs at infrequent intervals? Then probably you will be interested in one of several newer, more efficient applicators.

The need for this type of survey increases with the age of the equipment. Every day newer, more efficient and more reliable methods of application are developed. This is just one phase of the Gulf service plan known as Gulf Periodic Consultation Service. For additional information and for expert help on any specific lubrication problem, call in a Gulf Lubrication Engineer today or send the coupon below.

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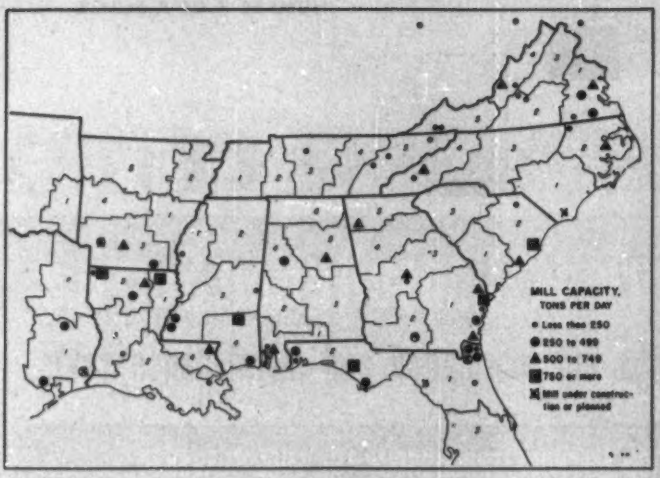


Figure 1.—Pulp mills drawing wood from the South, 1950. Numbered areas are Forest Survey regions.

cent above 1949, hardwood 37.4 percent more, and chestnut 9.3 percent less.

Since total receipts of domestic pulpwood at all mills in the United States were 20,714,000 cords in 1950, the South produced 60 percent of all the pulpwood cut in the Nation. Among the southern States, Georgia was the largest producer, accounting for almost 18 percent of the South's and 11 percent of the Nation's pulpwood cut *(Table 1)*. The other southern States, except Tennessee, showed an increase in production over 1949. The largest increase was in Alabama.

Production per county varied from none to nearly 190,000 cords. Twenty-six counties, distributed throughout the South, had cuts of over 60,000 cords apiece. The five leading counties were Baldwin and Mobile in Alabama, Georgetown and Fairfield in South Carolina, and Nassau in Florida.

With $260 million planned for expansion, consumption of pulp wood upon completion of the new mills will reach 17 to 20 million cords by 1953-4.

All charts are taken from Forest Survey Release 69.

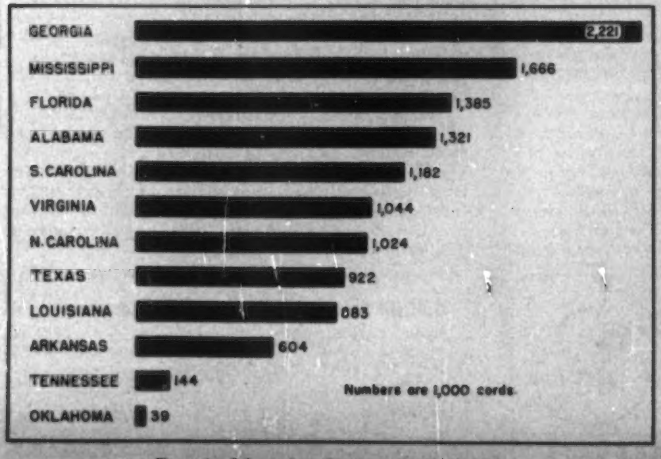


Figure 2.—Pulpwood production in the South, 1950.

PEOPLE

(Continued from page 14)

the board and president, Mr. Bridghan has held the joint offices of president and treasurer. Mr. Bridgham continued to hold the office of president of the company and Cassius M. Bryan continues as chairman of the board.

HENRY D. JOHNSTON was elected to fill the vacancy on the Board

Henry D. Johnston

of Directors, existing since the death of Mr. Williamson. The stockholders also re-elected the following directors: Cassius M. Bryan, F. Nelson Bridgham, Arthur E. Shattuc, Horace J. Rice, Bradley F. Stafford, Roy F. Arnold, William A. McGilpin, Harry E. Riggs, Laurence W. Shattuck, Nelson Feeley and Harold A. Bolles.

CHARLES S. GREY has been appointed head of the Advertising, Sales Promotion and Customers Relations Division of Mason Envelope Co., Inc.

MELVIN H. BAKER, former president, has been elected to the new position of chairman of the board of National Gypsum Co., Buffalo, N. Y.

LEWIS R. SANDERSON, former executive vice-president, has been elected Baker's successor as president.

FRED A. MANSKE, vice-president in charge of manufacturing of National Gypsum, was appointed vice-president in charge of operations, and Production Manager Wells F. Anderson was named to succeed Manske.

The company said the changes were made to "broaden top management to better integrate present operations and develop further expansion potentials." Chairman Baker will handle the firm's policies on finances, capital disbursements, major personnel policies and exploration of growth opportunities.

President Sanderson will supervise day-to-day operations, sales, accounting, engineering and research.

BEN KAUFMAN, director of public relations of the National Association of Waste Material Dealers, Inc., has resigned from the NAWMD staff.

NEW MOORE & WHITE 4-DRUM WINDER

HERE is an expertly engineered and precision-built *heavy-duty* 4-drum board winder—fast, efficient and dependable to fit the tempo of today's demands and operations. It is operated by a Moore & White mechanical drive, and all moving parts run in anti-friction bearings. It is equipped with M & W shear-cut slitters to insure clean edges to the rolls.

This new Moore & White winder will wind rolls up to 84 inches in diameter. It is available in widths up to the maximum requirements of modern paperboard mills. We can equip it with automatic roll ejectors which permit the completed rolls to be quickly and easily removed from the winder drums without being tended or handled by an overhead crane.

Write or call us today for more detailed information. Our sales engineers will make a prompt survey of your requirements and oversee the installation of the Moore & White winder or other equipment you need for faster, more trouble-free and more profitable operation.

The MOORE & WHITE Company

15th STREET & LEHIGH AVENUE · PHILADELPHIA 32, PA.

Represented on the West Coast by Dan E. Charles Agency, 618 Jones Building, 1331 Third Avenue, Seattle 1, Wash.

Above—Moore & White 4-drum board winder equipped with Moore & White shear-cut slitters

Above—Moore & White 4-drum winder equipped with automatic roll ejectors

CUSTOM-BUILT MACHINES FOR MAKERS OF PAPER AND PAPERBOARD

PRICES

The prices below reflect market quotations in New York at the mill level on standard grades. Does not include spot offerings.

PAPER AND BOARD

Standard News, Delivered Ports

Rolls, contract, per ton	$114.00/116.00
Sheets	130.00/ —

Kraft—per cwt. 50# base wgt. OPS Ceiling CPR 88

F.o.b. Southern & Western integrated mills. C.l. Freight allowed up to $10 a ton.

Standard Wrapping, ctr. rolls	$7.75/ —
Butchers, counter rolls	8.25/ —
Standard Bag, mill rolls	7.50/ —
Shipping Sack, mill rolls	7.75/ —
Gumming, mill rolls	8.00/ —
Asphalting, mill rolls	7.75/ —
Envelope, Sub. 20, mill rolls	9.25/ —

Tissues— per ream 24x36 (480) 10 lbs. 2500 lbs or more

Wh. No. 1 Frd.	$2.25 /$2.40
Wh. No. 1 MG	2.25 / 2.40
Wh. No. 1½	1.95 / 2.05
Wh. No. 2	1.75 / 2.00
Kraft Anti-Tar 20x30	2.12 / 2.25
White Anti-Tar 20x30	2.20 / —

Toilet— per case of 100 rolls—1M sheets

Unbleached 4½x4½	$8.00/$8.25
Unbleached 4½x5, 650 sheets	6.65/ —
Bleached 4½x4½	10.00/12.50
Bleached 4½x5	9.96/ —
Per Case of 50 rolls—2000 sheets	
Unbleached 4½x4½	$8.00/$9.75
Bleached 4½x4½	6.95/ —
Per Case of 100 rolls—1000 sheets	
Facial, 4½x4½, 2-ply	$8.95/10.37
4½x5, 2-ply	10.25/10.75

Paper Towels— per case of 3750

Wh. Jr. M'ti'd 9½x9½	$6.40
Br. Sr. M'ti'd 9½x12	4.40
Br. Jr. M'ti'd 9½x9½	3.90
Br. Jr. Sgl. fold 9½x10½	3.95
Bleed. 7½x11, 48/50 rolls	$6.80/$7.92

Manila, per cwt.

No. 1 Jute Tag, 100-lb., sheets	$20.55/22.55
Reg. Jute M.F. 40-lb., sheets	19.50/21.50
Printing Manila	10.50/12.00

Gummed Tape—per bdl., 500 bdls. or more

60 lb. 375 ft. GSI	$7.20 / —
60 lb. 600 ft. GSI	7.20 / —
15 lb. 800 ft. GSI	8.28 / —
15 lb. 500 ft. GSO	6.21 / —

MARKET WOOD PULP

First Quarter Contract Prices. Per Short Air-Dry Ton

	Varying freight allowances		On Dock Atlantic Ports		
	*U. S.	Canadian	*Swedish	*Finnish	*Norwegian
Groundwood	$92.50/ —	$$95.00/100.00			
Sulfate, Bleached	145.90/ —	190.00/200.00	$230.00/ —	$230.00/ —	$230.00/ —
Semi-bleached Sulfate	140.00/ —				
Sulfate, Unbl.	132.50/ —	145.00/175.00	200.00/ —	200.00/ —	
Sulfite, Bichd.	140.00/ —	160.00/175.00	225.00/ —	225.00/ —	225.00/ —
Sulfite, Unbichd.	132.50/ —	150.00/160.00	200.00/ —	200.00/ —	
Sulfite, Unbl'd (Glessine)		164.00/ —			
Soda, Bichd.	140.00/ —	155.00/160.00			
Sulfite Screenings	72.50/ —				
Sulfate Screenings	67.50/ —				
Groundwood Screenings	60.00/ —				
Unbichd Sulfate Sideruns	132.50/ —				
Stand. News. Sideruns	92.50/ —	106.00 —			

*OPS Ceiling, CPR 49 ‡ F.o.b. Shipping Point.

Boards per ton—

Filled News	$107.50/ —
Plain Chip	105.00/107.50
Bichd. Mix. L-d. Chip	147.50/ —
White Pat. coated .020	170.00/ —
Kraft Liners 42 lb.	115.00/117.50
Kraft Corr. .009	122.50/126.00
Binders Boards	137.50/140.00

The following prices are representative distributors' resale prices:

Rag Content Bonds and Ledgers—White, 20 lb.

Bonds	4 Cts.
	per cwt.
100% Rag Ex. No. 1	$70.45/$75.90
100% Rag	62.65/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Cts.
	per cwt.
100% Rag Ex. No. 1	$72.65/$72.80
100% Rag	63.90/ —
75% Rag	49.40/ —
50% Rag	40.20/ —
25% Rag	33.00/ 34.30

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Cts.
	per cwt.
Watermarked	$19.00/$20.50
Plain	18.40/ 19.50

Ledgers	4 Cts.
	per cwt.
Watermarked	$20.30/$21.80
Plain	19.35/ 20.80

White Book

Conversion Coated	Case
	per cwt.
No. 1	$23.90/$24.65
No. 2	22.15/ 23.40
No. 3	21.90/ 22.40
Machine Coated	
No. 1	$18.40/$18.90
No. 2	16.65/ 16.90
Uncoated	
No. 1 Antique (Watermarked)	$18.65/$19.65
Offset	18.65/ 19.90
A Grade E. F.	18.10/ 19.90
A Grade S. C.	18.65/ 19.40
B Grade E. F.	18.40/ —
B Grade S. C.	17.40/ 19.13

‡ Indicates a price change.

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range in each market on the date specified, as gathered from major dealers. ALL PRICES ARE STRICTLY NOMINAL.

	New York Dec. 6	Philadelphia Dec. 10	Boston Dec. 7	Chicago Dec. 3
No. 1 Mixed Paper	nominal	nominal	$16.00/ —	$10.00/ —
No. 1 News	12.00/ 14.00	11.00/ —	12.00/ 13.00	15.00/ —
Over-issue News	15.00/ 18.00	12.00/ 14.00	15.00/ 22.00	18.00/ —
Mill Wrappers (Sulfite)	13.00/ —	10.00/ —	12.00/ —	15.00/ —
Corrugated Containers	15.00/ —	12.00/ 14.00	15.00/ 15.50	15.00/ —
Double Kraft Ld. Corr. Cuts	35.00/ 57.50	35.00/ 50.00	40.00/ 57.50	50.00/ 57.50
100% Kraft Corr. Cuts	60.00/ 80.00	75.00/ 80.00	75.00/ 80.00	85.00/ —
Used Sugar & Flour Bags	45.00/ 50.00	35.00/ 50.00	45.00/ 46.50	40.00/ —
Super Resorted Br. Kraft	60.00/ 70.00	45.00/ 55.00	45.00/ 60.00	40.00/ —
New Br. Kraft Env. Cuts	115.00/125.00	100.00/ —	100.00/125.00	100.00/ —
New Br. Kraft Cuts	105.00/115.00	95.00/ —	85.00/105.00	90.00/ —
No. 1 Gdwd Shvs.	35.00/ 45.00	30.00/ 40.00	33.00/ 40.00	30.00/ —
White Newsblanks	60.00/ 70.00	60.00/ 70.00	55.00/ 75.00	50.00/ —
No. 1 Flyleaf Shvs.	35.00/ 60.00	45.00/ 50.00	45.00/ 70.00	60.00/ —
No. 1 Soft Wht. Shvs.	125.00/140.00	110.00/ —	125.00/145.00	125.00/ —
Super Soft Wht. Shvs.	160.00/165.00	— / —	140.00/165.00	135.00/ —
Hd. Wht. Shvs.	160.00/170.00	145.00/155.00	150.00/175.00	140.00/ —
Hd. Wht. Env. Cuts	165.00/175.00	170.00/175.00	175.00/190.00	150.00/ —
New Manila Env. Cuts	100.00/120.00	95.00/110.00	110.00/125.00	65.00/ —
Col Tab Cards	80.00/ 85.00	70.00/ 75.00	80.00/ 95.00	85.00/ —
Manila Tab Cards	110.00/120.00	100.00/110.00	120.00/130.00	100.00/ —
No 1 Mixed Ledger	75.00/ 80.00	70.00/ 75.00	67.00/ 95.00	85.00/ —
White Ledger	100.00/110.00	95.00/105.00	100.00/110.00	100.00/ —
No 1 Book & Mag.†	33.00/ 37.00	22.00/ 24.00	29.00/ 32.00	25.00/ —
No. 1 Rep'd. Hvy. Books‡	43.00/ 50.00	30.00/ 32.00	45.00/ 57.00	40.00/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. ‖ Deld.

RAG MARKET

New Domestic Cotton Cuttings
OPS Ceiling Price, CPR 28
Delivered Mill Basis

Add 7½% Dealer Commission

No. 1 White Shirts	$21.00
No. 1 Unbichd. Muslins	21.00
Bichd. & Unbichd. Underwears	21.00
Bichd. Canton Flannels	21.00
No. 1 Light Silesias	16.00
No. 1 Light Prints	11.50
No. 1 Blue Overalls	14.50
Suntan Khakis	11.50

Add 10% Dealer Commission

Fancy Shirts	$10.00
Indigo Blues	10.00
Mixed Khakis	8.00
Corduroys	8.00
Cottonades	8.00
No. 1 Washables	6.50

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$6.00/$6.50
Cotton Pants & Overalls	6.50/ 6.75
Thirds and Blues, Repacked	5.00/ 5.50
No. 1 Roofing Rags	1.20/ 1.25
No. 2 Roofing Rags	1.00/ 1.10
No. 3 & 4 Roofing Rags	.90/ 1.00

Bagging
(Prices to Dealers, f.o.b. N. Y.)
PRICES NOMINAL

	Per 100 lbs
Foreign Gunny	$5.50/$6.25
Domestic Gunny, No. 1	5.50/ 6.25
Heavy Wool Tares	5.50/ 6.00
Foreign Manila Rope	9.00/ 9.25
Domestic Manila Rope	9.00/ 9.25
Jute Strings	6.00/ 6.50
No. 1 Sisal Strings	8.50/ 8.75
Paper Mill Tares	5.25/ 5.50
Foreign Scrap Burlap	4.75/ 5.25
Domestic Scrap Burlap	5.50/ 6.00
Austr. Wool Pouches	7.50/ 8.00
New Burlap Cuttings	7.00/ 7.50

MATERIAL PRICES

Aluminum sulfate:		
coml. bags, wks.....cwt.	1.65	
iron-free, c.l.	3.25	
Alcohol, ethyl:		
tax free, dms. c.l.....gal.	1.01	/ 1.05½
deld. East Miss.		
Alcohol, methyl:		
Synthetic, Zone 1, dms.		
c.l. fit. alld.....gal.	.44	
Casein, acid prec.:		
dom. sh. pt. c.l. .....lb.	.33	/ .41½
imp. ex. dock .....lb.	.21	/ .36
Caustic soda:		
c.l. wks. solid, 76% cwt.....	3.35	
bak. & grd. 100-lb. drums...	3.75	
liquid 50% tanks....	2.55	
liquid 70% tanks....	2.65	
China clay:		
dom. air-float. c.l. wks. ton	10.00	
water-washed, lump, filler....	11.00	
coating	17.60	/30.50
imported, ex whse...short ton	15.20	/28.35
Chlorine:		
single-unit tanks, works..cwt.	2.70	
multi-unit .....cwt.	3.20	/ 4.40
Formaldehyde:		
USP, inh. dms, c.l. wks....lb.	.0625/	.0675
l.c.l., E. wks.....	.0675/	.0725
Fuel oil:		
Bunker C, No. 6 Cal. hvy.		
tanks, refinery .....bbl.	1.95	/ 2.15
light .....bbl.	2.00	/ 2.25
Hydrogen peroxide:		
USP, 35% chys. E. of Miss. lb.	.23½/	.26½
Lime:		
hydrated, bags, wks. .....tons	13.50	
Rosin:		
B gum, drms, c.l. Savan..cwt.	7.00	/ 9.08*
G, H, I, K .....cwt.	8.02	/ 9.49*
FF, wood, do.....cwt.	6.80	/ 7.30*
*OPS Ceiling, CPR 52.		
Rosin size:		
70%, gum & pale grds, tank		
cars, south, sh. pt. ....cwt.	7.50	/ 7.60
Salt cake:		
dom. bulk, c.l. wks.....ton	17.00	
wks. frt. all.....ton	20.00	/22.00
Soda ash:		
light, 58%, bags, wks.....	1.50	
bulk .....cwt.	1.20	
Sodium silcate, 40°:		
turbid. c.l. wks.....cwt.	1.30	/
l.c.l. wks.	1.60	/ 1.85
Sodium peroxide:		
drms. c.l. E. of Miss.....lb.	.21	
l.c.l. do. .....lb.	.21½/	.22
Soybean, protein:		
chem. isol, wks, c.l.....lb.	.24	/ .28
Cinn. and Chic.		
Sulfuric acid:		
60° Be. chys. c.l. wks.....cwt.	1.75	/ —
l.c.l. wks. .....cwt.	2.05	/ 2.85
Sulfur:		
crude, c.l. mines, contract, long ton	21.00	/22.00
f.o.b. vessels Gulf	22.50	/23.50
Sulfur dioxide:		
liquid, coml. cyl. wks.....lb.	.09	
multi-unit cars .....lb.	.0535	
Starches:		
pearl corn, bags, c.l. wks..cwt.	6.34	/ —
white dextrines, c.l. wks...cwt.	7.73	/ —
potato, Idaho, c.l. wks....cwt.	6.50	/ —
potato, Maine, c.l. wks....cwt.	nominal	
tapioca, conv. dextrines..cwt.	6.50	/ 7.75
Talc:		
domestic, 50-lb. sacks, c.l.		
wks. .....ton	25.00	/30.00
Titanium dioxide:		
anastase, c|l deld., bags....lb.	.21	/ .21½
l.c.l. deld. .....lb.	.22	/ .22½
rutile, c.l. deld.....lb.	.23	/ .23½
l.c.l. deld. .....lb.	.24	/ .24½

ASSOCIATIONS

Eastern District Meets at Glens Falls

A discussion on "Paper for Its Intended Use" featured a dinner meeting of the Eastern District of the Empire State Section of TAPPI, Dec. 13 at Milfranks Restaurant. The speakers gave the specifications and objectives of papers designed for particular uses and markets.

The moderator was the program chairman, Earl H. Johnson of Smith and Thompson Paper Company of Greenwich, who introduced Lyman A. Beaman, Jr., of Finch Pruyn and Co., who discussed printing paper; Hugh H. Lavery of the International Paper Co. of Palmer, whose subject was also printing paper; Thomas F. LaHaies, Jr., of the Imperial Wallpaper Co. at Plattsburgh who talked on Number 2 hanging paper; Norman L. Rauscher of the Diamond Match Co. at Plattsburgh, who took wax paper as his subject; and Robert E. March of the Marinette Paper Co. at South Glens Falls who read a paper on tissue paper prepared by W. S. Spiller of technical control in his plant, who was unable to be present.

Mr. Beaman said that groundwood specialty papers, once thought of in the industry as glorified newsprint good only for cheap magazines, in the

HAUG REFINERS

—are **SAVING** more than **600 TONS** of GROUNDWOOD, SULPHITE and KRAFT REJECTS **EACH DAY** in the U. S., Canada and Europe . . . This Haug Refined Stock is marketed at the same price as virgin pulp, and the ANNUAL DOLLAR SAVING in wood, alone, is OVER SIX MILLIONS.

ANTON J. HAUG

64 TAYLOR ROAD, NASHUA, N. H.

past 20 years have taken a dominant position in the printing paper industry and constantly grow into new fields. He said some of the characteristics of groundwood which have made it so useful for printing are opacity, absorbency, resilience and compressibility. The speaker discussed the development of papers for Reader's Digest, of which Finch Pruyn is one of the suppliers.

Mr. Lavery of International noted the desirable properties of groundwood papers as less tendency to curl and cockle than a free sheet having better dimensional stability under changing humidity conditions; better resilience than a free sheet of corresponding weight and equivalent surface; relatively high opacity, and being generally softer and thereby handling well over a fast rotary press, yet stiff enough for handling in the folder and bindery.

Confining his subject to wax papers for household use, Mr. Rauscher of the Diamond Match Co. explained the problems encountered in keeping the product as highly transparent as possible yet not allowing the passage of air. Also the reduction of bulk, particularly from a cost standpoint, is a consideration.

Mr. Rauscher said best results are obtained by using a strong paper with a relatively high moisture, 12 to 15 percent as compared with four to six percent in some other types of paper, supercalendering, and a double dip method of wax application. He noted that the paper should be heated before reaching the wax baths. The speaker also described the single dip waxing method and opaque waxing, the application of wax to a sheet which has been loaded with an opaque filler. He commented on the properties peculiar to these types of wax paper.

Mr. LaHaise of Imperial Wallpaper in outlining the specifications for Num 2 hanging paper discussed the body needed to resist weakening from the paste applied, resistance to tearing in application, and ability to take up to 15 colors in printing. He described the application of the background coat which gives it many of these properties.

ELIXMAN
CORES
CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.
CORINTH, N. Y.

TAPPI Annual Meeting Program

The following is a preliminary program of the annual meeting of the Technical Association of the Pulp and Paper Industry to be held at the Commodore Hotel, New York, N. Y., on February 18-21, 1952.

The papers indicated below have been offered for the meeting and will be presented if the speakers are ready to do so.

General Session

1. Secretary's Report
2. President's Address
3. Report of Teller's Committee
4. Report of Joint Textbook Committee
5. Address: "Chemical Raw Materials," by Walter J. Murphy, Editor, Industrial & Engineering Chemistry, Washington, D. C.

Preparation of Papermaking Materials

1. "Mechanical Correction of Two-Sidedness," by M. J. Landberg and P. R. Schreiber, General Dyestuff Corp., and H. H. Behrens, Irvin Dyestuff Corp., Ltd. (Canada).
2. "The Use of Graphic Panels in the Paper Industry," by Donald B. Scrivens, Taylor Instrument Cos., Rochester, N. Y.
3. "The Beater-Pulper," by Arthur Infanger, Cowles Co., Cayuga, N. Y.

Water

1. "The Overall Water Supply Situation Throughout the United States Pulp and Paper Regions," by Fred H. Klaer, Jr., Ranney Method Water Supplies, Inc., Columbus, Ohio.
2. "The Activation of Silica and Its Use in Treatment of Mill Water Supply, White Water Utilization and Waste Disposal," by A. E. Griffin, Wallace & Tiernan, Inc., Belleville, N. J.
3. "Use of Ozone in Water Purification," by Victor Hahn, Welsbach Corp., Philadelphia, Pa.

Plastics

1. "Acetylation of Cellulose," by R. C. Blume, E. I. du Pont de Nemours & Co., Inc., Waynesboro, Va.
2. "Mechanics of Adding Latex to Paper at the Head Box," by H. G. Bimmerman, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Chemical Methods and Pulp Testing

1. "The Determination of Copper in Wood Pulp With Tetraethylenpentamine," by R. M. Kingsbury and C. L. Lake, Forest Products Laboratory, Madison, Wis.
2. "Determination of Pentosans in Highly Purified Wood Pulp," by Edgar D. Smith, Louis F. Pagel and L. N. Rogers, Buckeye Cotton Oil Co., Memphis, Tenn.
3. "A Colorimetric Method for the Determination of Pentosan Content of Highly Refined Pulps," by I. Davis and A. S. O'Brien, Eastman Kodak Co., Rochester, N. Y.
4. "On Sampling of Wood Pulp for Moisture," by A. P. Bellinghausen, Kimberly-Clark Corp., Neenah, Wis.

Packaging Materials and Containers

1. "Arganoleptic Evaluation of Paper Products for Food Packaging," by L. C. Cartwright, Foster D. Snell, Inc., New York, N. Y.
2. "Gas Permeability," by Arthur H. Landrock, Massachusetts Institute of Technology, Cambridge, Mass.
3. "Basic Design Data for the Use of Fiberboard in Shipping Containers," by K. O. Kellicutt and E. F. Landt, Forest Products Laboratory, Madison, Wis.

Acid Pulping

1. "Pilot Plant Recovery of Heat and Sulphur from Spent Ammonia Base Sulphite Pulping Liquor," by J. H. Hull, Crown Zellerbach Corp., Camas, Wash., and G. V. Palmrose, Soundview Division, Scott Paper Co., Everett, Wash.
2. "Acid Pulping Committee Report on TAPPI Strainer and Circulation Survey," by John M. McEwan, Pulp Division, Weyerhaeuser Timber Co., Everett, Wash.
3. "Sulphite Digester Lining Problems," by William H. Kraske, Oxford Paper Co., Rumford, Maine.
4. "Magnesia Base Recovery for the Sulphite Pulping Industry," by Svarre Hazelquist, Pulp Division, Weyerhaeuser Timber Co., Longview, Wash., and Charles E. Rogers, Babcock & Wilcox Co., Alliance, Ohio.

Fundamental Research

1. "Physical Nature of Hemicelluloses" (Institute of Paper Chemistry).
2. "Effect of Various Constituents of Wood and Pulp on the Ignition Point of the Material" (Institute of Paper Chemistry).

Microbiological

1. "A Method of Laboratory Evaluation of Chemicals as Slimicides," by S. I. Cohen, Gallowhur Chemical Corp., New York, N. Y.
2. "Performance of Paper Machine Wet Felts II," by D. W. French, C. M. Christensen, and S. J. Buckman, Buckman Laboratories, Memphis, Tenn.
3. "Mildew Resistance," by L. S. Vinson, Lever Brothers Co., New York, N. Y.
4. Paper by B. F. Shima, Institute of Paper Chemistry, Appleton, Wis.

Paper Making (Fourdrinier)

1. Round Table discussion of "Curl."

Graphic-Arts

1. "Pick Testing," by R. F. Reed and Gordon Wheeler, Lithographic Technical Foundation, Chicago, Ill.

Wet Strength

1. Paper by American Cyanamid Co.
2. Paper by Rohm & Haas Co.
3. Round Table discussion of Testing Methods.

Alkaline Pulping and Chemical Engineering

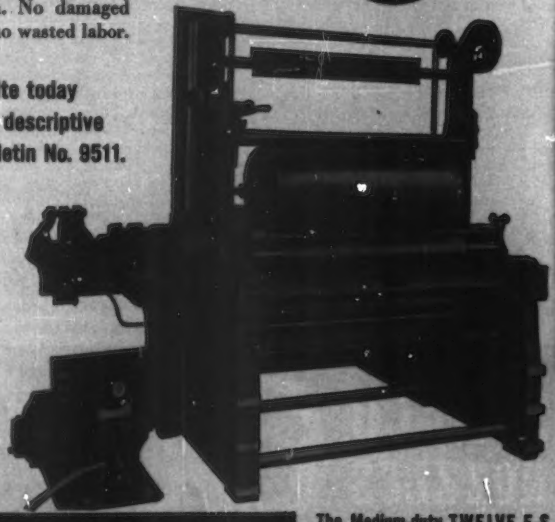
1. Flow Sheets of Mill Processes.

(Continued on page 45)

Now... Perfect Roll S-E-P-A-R-A-T-I-O-N

Any dry, uncoated paper can now be slit and rewound into *freely separable* rolls of any width with the new Johnstone TWELVE and FOURTEEN F-S Slitters & Roll Winders. There's nothing to compare with them in the industry. For the first time, hammering and prying are made completely unnecessary in the finishing room. No damaged rolls... no wasted labor.

Write today for descriptive bulletin No. 9511.



JOHNSTONE
Engineering & Machine Co.
PARKESBURG, PENNA.

The Medium-duty TWELVE F-S has 4" winding drums. Standard sizes handle rolls 32", 42", and 52" wide; rewound diameters up to 24". The FOURTEEN F-S, for heavy duty, has 6¼" winding drums. Standard sizes take rolls 42", 52", 62", 72", & 82" wide; rewound diameters up to 36".

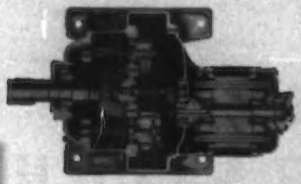
New Equipment

Supplies and Materials

High Torque Low-Speed Motor

Through triple reduction gearing a high torque, low-speed motor capable of ratios up to 175:1 is offered.

By the use of two secondary pinions driving the output gear, the effective torque rating is doubled. The load is



distributed equally between the two pinions by a splined herringbone pinion. Consisting of an efficient, high-speed motor with torque multiplying, built-in gearing, the new motor is designed to reduce the amount of space necessary to house this type drive, it is stated.

Available in 1 to 10 h.p. with speed ranges of 5 to 25 r.p.m., the Type GM Syncrogear possesses the advanced features of normalized castings, asbestos-protected windings, solid centricast rotor and Lubriflush lubrication, the manufacturer stated. For descriptive bulletin, write U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif.

Teflon Bellows Connector

Fabricated of chemically-inert Teflon, the new "John Crane" Bellows Type Connector has many pipe-line applications where vibration, expansion and electrolysis exist in the handling of corrosive liquids or gases and solvents. The new connector is electrically non-conductive, flexible even at 94°F. and as strong at 480°F. as at 70°F., according to the manufacturer.

This bellows connector serves as a vibration dampener as well as an expansion joint, connects misaligned couplings and insulates flanges electrically. End flanges of the joint are French-type envelope gaskets made integral with the joint for easy assembly between companion flanges and a tight, leak-proof seal on installation.

A free booklet, "John Crane Chemlon . . . the best in Teflon," is offered by the manufacturer, Crane Packing Co., Dept. P4, 1800 Cuyler Ave., Chicago 13, Ill.

Low-Cost Tank Insulation

Development of a new insulating method which cuts costs for baking-type protective coatings is announced. Economical and simple, the new process insulates giant metal tanks which are designed for industrial use where corrosion or iron contamination is a problem, and which because of their size cannot be baked in an oven.

Insulating material is vermiculite high-temperature cement which is sprayed on with a gun in two 3/16" coats over the entire exterior of the container. At the same time, the first phenolic resin coating is put on inside. Raw flame is then introduced into the interior with a specially-designed burner fueled with Propane gas. While the phenolic resin coat is being baked on, the vermiculite cement is drying, so that the fuel serves a double purpose. The second 3/16" coat of vermiculite is then sprayed on for subsequent bakings, each of which requires from five to six hours. There may be as many as ten separate bakings for one tank. In the initial stages, the temperature inside the container is maintained at 350°F.; in the final stage, at 500°F.

Without insulation, it would be virtually impossible to secure these temperatures, it is stated. The tank is out in the open, and radiation from a metal container 8 to 20 feet in diameter and 20 to 40 feet long would be too great to get the tank up to heat, regardless of how much fuel was wasted. It is also extremely important to maintain an even temperature throughout the interior, in itself something of a feat with so large a container.

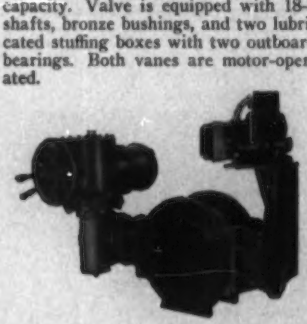
The new insulating material is held to be highly efficient and to produce uniform curing, particularly around projecting fixtures. When curing is finished, the high-temperature vermiculite cement is scraped off and used again.

A specialist in container coatings, pipes and fittings for pulp and paper mills, the manufacturer maintains a crew for field jobs where tank size makes shipment impractical.

Write to Industrial Coatings, Ltd., Vancouver, B. C.

Dual Purpose Valve

This 125-pound cast iron valve consists of a 12-inch beveled vane which seats against the body sidewall with a 4-inch vane mounted in the center of the larger vane, a valve within a valve. It is employed in a turbine by-pass line for controlling the required quantity of water when the turbine is not in use or when it is operating at reduced capacity. Valve is equipped with 18-8 shafts, bronze bushings, and two lubricated stuffing boxes with two outboard bearings. Both vanes are motor-operated.



Designed for either a high-pressure drop and small volume or a low pressure drop and large volume, this type valve is frequently furnished with a small free revolving vane.

Known as "No. 818," the unit is available in various combinations of sizes and for elevated or sub-zero temperatures, either manual or automatic control.

Manufactured by R-S Products Corp., an S. Morgan Smith Co. subsidiary, 4600 Germantown Ave., Philadelphia 44, Pa.

Unit Molded Trucks

Announced is a new line of molded Fiberglas trucks. Light-weight and easily cleaned, each truck is molded complete in one piece, embodying several special features. Unit molding eliminates the need for rivets, bolts, nuts, screws or other fastening devices apt to snag materials. A rounded, reinforcing top-rail is built in, and vertical ribs are built in to supply extra strength. The result is a strong, smooth interior and exterior finish with controlled wall thicknesses. All horizontal and vertical corners have a gently

curved radius designed to make them easy to drain and clean.

The new trucks are said to be non-conductive to static electricity and to withstand all chemicals commonly used in such processes as dyeing and finishing. Construction is such that in event of accidental damage any truck can be repaired by unskilled labor right on the job.

Propelled on easily replaceable casters of several choices, Laminex molded Fiberglas trucks are provided in a range of sizes up to a model capable of handling 3500 pounds of goods. Data on molded trucks for all purposes hitherto served by war-scarce canvas or steel trucks are available from Laminex Corp., 994 Jefferson St., Fall River, Mass.

High Heat Aluminum Paint

A new maintenance paint is designed to protect metals subjected to temperatures in the range of 200° to 1000°F.

Called Thermalite, it is a high-heat aluminum paint which presents a clean, smooth, silver-bright finish, combining good appearance with high heat resistance. It differs from older types of aluminum maintenance paints in that it contains the resin compound, silicones.

In addition to its main function of preventing the attack of rust and corrosion on hot metal surfaces, the new paint offers resistance to weather, chemical fumes and salt spray. It does not discolor, blister, flake or burn off in temperatures up to 1000°F., it is claimed. Developed specifically for high-temperature application, it takes a temperature of at least 200° (for an hour or more) to cause it to set or fuse to the surface.

It may be applied either indoors or outside, by brush or spray, and dries free from brush marks.

Manufactured by Tropical Paint & Oil Co., Cleveland, Ohio.

NEW LITERATURE

American Management Assn., 330 W. 42nd St., New York 18, N. Y. Booklets: Insurance Series No. 90, "Insurance Needs in a Preparedness Economy." Consists of papers presented at the Insurance Conference of the AMA held in New York, May, 1951. 44 pp. Price $1. (members), $1.25 (non-members) . . . Insurance Series No. 91, "Protecting Company Assets and Earnings: New Opportunities for the Insurance Buyer." Consists of papers presented at the Insurance Conference of the AMA, held in New York, May, 1951. 40 pp. Price $1. (members), $1.25 (non-members) . . . Marketing Series No. 82, "How Management is Meeting Changed Marketing Conditions." Consists of papers presented at the Marketing Conference of the AMA, held in New York, March, 1951. 32 pp. Price $1. (members), $1.25 (non-members) . . . Packaging Series No. 36, "How Industry is Solving its Packaging Problems." Consists of papers presented at the Packaging Conference of the AMA, held in New York, April, 1951. 40 pp. Price $1. (members), $1.25 (non-members) . . . General Management Series No. 152, "New Perspectives on the Administrator's Job." Consists of papers presented at the General Management Conference of the AMA, held in New York, June, 1951. 36 pp. Price $1. (members), $1.25 (non-members) . . . "The Profile Method of High-Level Job Evaluation," by Edward N. Hay, and Dale Purves, Edward N. Hay & Associates, Inc. Price 35c.

Chamber of Commerce of the United States, Washington 6, D. C. Bulletin, "Labor Relations Newsletter." Expressed views of William B. Barton, Manager of the Chamber Dept. on the demands of labor for pensions, welfare plans, together with "productivity" wage increases.

Economic Research Department, Chamber of Commerce of the United States, Washington 6, D. C. Booklet, "How Much Can Our Economy Stand?" A report of the Committee on Economic Policy after an examination of the impact of taxes and expenditures. Single copy 50c, 2-5 copies 35c, 6-49 copies 25c, 50 or more copies 15c. 34 pp.

Fansteel Metallurgical Corp., Tantalum Division, North Chicago, Ill. Bulletin Ta-555, "Tantalum Heaters for Acid Solutions." Describes and

Redlers

PICK UP the CHIPS

Store and Carry Them to the Digestors

Chip handling is only one of the many jobs S-A Redler Conveyor-Elevators handle in a speedy trouble-free operation—fully protected from weather and spillage. They are compact and, as illustrated by this installation, can be fitted readily into existing plant layouts.

S-A engineers have developed a great variety of bulk materials handling equipment with which they can design unusually efficient systems. If you have an operation where handling costs are high or delays and trouble occur, see what S-A engineers can suggest. Write us.

GREEN BAY PULP & PAPER CO. GREEN BAY, WIS.

From wood-room at right in picture, a horizontal run of one Redler Conveyor picks up wood chips and elevates them 52 feet, then bends to another horizontal run discharging into two storage bins. S-A Bin Discharge Unit, with revolving arch breaker to keep chips flowing freely, reclaims and feeds to the horizontal run of another Redler beneath bins. Same conveyor inclines upward 58 feet to top of building at left. Here it levels off and conveys horizontally over digesters to which it discharges. Low cost handling is achieved at 39 to 47 tons per hour.

1901-1951

50 years experience with bulk handling

STEPHEN S-A ADAMSON MFG. CO.

42 Ridgeway Avenue, Aurora, Illinois · Los Angeles, Calif. · Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
Process Studies, Design, Specifications and Engineering Supervision
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Steam, Hydraulic and Electrical Engineering Reports, Consultation and Valuations
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SPECIALIZATION...
Modern Processing Methods
• Consider Ferguson's experience and ability when confronted with problems of processing procedures and/or equipment.
Preliminary Discussions In Confidence and Without Obligation
THE H. K. FERGUSON COMPANY
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Headquarters: Ferguson Building, Cleveland, Ohio
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APPLETON FELTS
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MISCO
STAINLESS STEEL CASTINGS
FOR ALL EQUIPMENT EXPOSED TO CORROSION BY SULPHITE ACIDS OR OTHER CORROSIVE AGENTS
MICHIGAN STEEL CASTING CO.
DETROIT 7, MICHIGAN

illustrates the different types of Tantalum heaters and their applications. Includes charts on corrosion resistance, dimensions, heating, capacities, etc.

Foster Wheeler Corp., 165 Broadway, New York 6, N. Y. Catalog Series AG, "Package Steam Generators." Technical and sales copy with cutaways, dimensional charts, steam-oil rates charts, etc.

General Dyestuff Corp., 435 Hudson St., New York 14, N. Y. Circulars. (1) AP-15, "Nekal BX High Conc.; For Paper and Pigment Applications and Miscellaneous Uses." (2) AP-14, "Igepon T. Gel in the Paper Trade." (3) G-695, "Pigment Green BSA Supra Paste in the Paper Trade." (4) G-693, "Naphthlene Green V Extra Conc. CF." Technical data Sheets.

General Electric Co., Schenectady 5, N. Y. Bulletin GEA-4979A, "New Motor Control Center Nema Size 1 Through 5 Starter Units." Details the new center, pre-engineered, factory wired and assembled, and its many standard components and accessories as developed for use in power stations, paper mills, chemical, and processing plants. Also, three new publications on limit switches: Bulletin GEA-5704, "Rotating Type Limit Switch." Bulletin GEA-5705, "Lever-Type Limit Switch." Bulletin GEA-5707, "Track-Type Limit Switch."

National Assn. of Cost Accountants, 505 Park Ave., New York 22, N. Y. Research Study, "The Assignment of Nonmanufacturing Costs to Territories and Other Segments," by N.A.C.A.

Omega Machine Co., 345 Harris Avenue, Providence 1, R. I. Bulletin No. 35-F5B, "Omega Belt Feeder, Gravimetric (Weighing) Model." Lists features of the feeder, describes operations of the vibratory feeder, weighbelt, scale beam and all other parts. Illustrated.

Remington Rand Inc., 315 Fourth Avenue, New York 10, N. Y. Book, "Production Control Systems and Procedures." A study in materials controls. Outlines complete procedures for engineering, production planning and progress, machine load, material and tool procurement and control. 56 pp. Available gratis to all executives.

Rohm & Haas Co., Resinous Products Div., Washington Sq., Philadelphia 5, Pa. Notes, "Uformite resins in waterproof starch Pastes." Gives specific recommendations for corrugating, solid fibre, and bag pasting.

"GIANT" RAG CUTTERS
for both large and small PAPER MILLS
TAYLOR-STILES Company
Capacities from one to five tons an hour.
10 Bridge St., Riegelsville, N. J.

Taber Instrument Corp., 111 Goundry St., North Tonawanda, N. Y. Bulletin No. 5003, "Taber Abraser Model 140 Standard Abrasion Testing Set." Enumerates the ranges of applications of this instrument to evaluate the resistance of surfaces to rubbing abrasion. Also, bulletin 5105, "New Taber Abraser Standard Abrasion Test." Specimen holder price list.

FINANCIAL

Olin Splits Stock

EAST ALTON, Ill.—A three-for-one split of Olin Industries, Inc., common capital stock was approved on December 20 by the corporation's stockholders, it was announced by John M. Olin, president. The Olin board of directors also approved the consolidation of the assets of Frost Lumber Industries, Inc., Shreveport, La., with Olin Industries.

According to the terms of the consolidation, Frost Lumber Industries, with timberlands, sawmills, railroads, and oil and gas properties in Louisiana, Arkansas and Texas will continue operations under its present management as a division of Olin Industries, Inc.

Because four railroads are involved, three owned by Frost and one controlled by Frost, the transaction involving the railroads must receive approval of the Interstate Commerce Commission.

The consolidation will give Olin the businesses and properties of Frost, including 450,000 acres of heavily forested land which is more than sufficient to support, on a perpetual yield basis, the nitrating and dissolving wood pulp mill which Olin plans to construct. The site of the pulp mill has not yet been determined.

NAPA REPORT

The Paper Market A general easiness is now common to most sections of the paper industry, with prices holding firm. Too many unpredictable factors influence this market to permit speculation on its future in 1952.

With domestic and international affairs continuing in their present state, supply and demand can come into good balance in 1952. Any important change in these factors can have rather dramatic effects on this and other markets.

It is quite possible that in 1952 we could have many things produced in excess and remaining unsold at current prices. A maximum military effort, equal to or larger than that of the last war, bought at today's prices,

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Report prepared by the Paper Committee of the National Association of Purchasing Agents, under the supervision of Chairman Edgar E. McCulley, Courier-Journal Lithographing Co., Inc., Louisville, Ky.

would do fantastic things to guesses for 1952 and to our economy.

Wood Pulp: KENDRICK BURNS, *S. D. Warren Company,* Cumberland Mills, Maine.

A new order from NPA, increasing the inventory limitation from 45 to 60 days on unbleached kraft, is expected soon. There may be a limited carry-over privilege running from one quarter to the next quarter. Mills will report on forms and not by telegram. Small mills do not have heavy inventories of pulp, but some of the large mills do have. A great many mills are still hunting for white pulp and are not having much success finding it.

Paper is not moving as well as it did and rayon production has also slowed up; so, the natural assumption is that the pulp situation will be easier before it gets any worse.

Capable analysts say that new pulp production is coming in too fast and that we face abundant supplies and lower prices late next year, now that the paper market has started to sag. They point out further that the Swedes have reduced their export tax on shipments to us, from 490 Kroner to 200 Kroner, or about $55 per ton. They fail to report that Scandinavian pulp is still selling well in Europe, at prices that net more to the shipper even on the old export tax of 490 Kroner, which still applies to European shipments. Nevertheless, we have yet to hear of anyone abandoning plans for increasing pulp production, and we are reminded of the sharp warnings a few years ago that the South was building too many pulp mills. The situation, of course, did not develop the way the prognosticators expected.

Getting down to plain English, it is still difficult, if not impossible, to pick up any good bleached chemical fibre, domestic, Canadian or Scandinavian. With the dislocations in the bleached pulp picture which have occurred lately, it seems unlikely that there will be much free market bleached pulp for some time to come. Unbleached sulphite is hard to find. There is plenty of unbleached kraft and plenty of groundwood.

The wastepaper situation continues to be tough. Some grades are down to the cost of collecting and baling. This may serve to depress pulp prices.

We doubt whether the Scandinavians ship us more pulp next year than they have been sending, even with the lower export tax.

However, the paper business is not nearly as good as it has been and, if it drops off much more, the people overseas may go back to their old trick of slashing prices to stay in the American market. There is no evidence of this yet.

Kraft Paper: EDMOND A. HUGHES, *The B. F. Goodrich Company,* Akron, Ohio.

The demand for kraft wrapping paper is still heavy, which keeps this item in short supply. There are several factors in the overall use of kraft paper (envelopes, gum tape, tire wrap) which may make more kraft wrapping paper available during the first quarter of 1952.

Fine Papers: Reported by Chairman E. E. MCCULLEY.

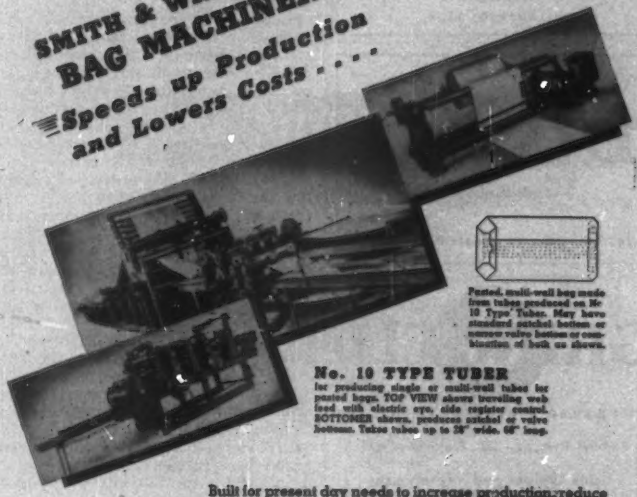
Fine papers are considerably tighter in supply than most other grades in the industry. The expansion under way in the industry and the development of pulp supplies by certain of its members promise improvement in 1952.

The period since Korea, with the resultant tremendous demand, has been handled in various ways, so that no one was seriously hurt. With some of the lessons learned by all in the industry during this period, future problems should be less difficult of solution.

Book Paper: PAUL B. SCOTT, *Kingsport Press,* Kingsport, Tenn.

Book paper prices are holding quite firm, in the face of smaller backlogs, and it is evident that many mills are running shorter hours than some three months ago. Several mills are looking for business, and are quoting on new business that, several months back, they would have turned down. Another interesting fact is that, where some mills had quotas set up for their customers, they are now increasing these from 11 percent to 25 percent,

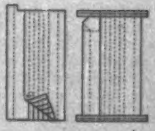
SMITH & WINCHESTER
BAG MACHINERY
Speeds up Production
and Lowers Costs . . . .



Pasted, multi-wall bag made from tubes produced on No. 10 Type Tuber. May have standard satchel bottom or sewed valve bottom or combination of both as shown.

No. 10 TYPE TUBER
for producing single or multi-wall tubes for pasted bags. TOP VIEW shows traveling web feed with electric eye, side register control. BOTTOMER shown, produces satchel or valve bottom. Takes tubes up to 38" wide, 68" long.

Built for present day needs to increase production, reduce spoilage and lower unit costs. These machines are custom-made to your requirements and will give continuous, trouble-free service. Increase your profits by speeding up production with Smith & Winchester equipment.



Multi-wall, sewed valve type, gussetted tube made on Smith & Winchester Multi-wall Tuber.

S & W MULTI-WALL TUBER
Up to 100,000 valve notch tubes each 8-hour day may be produced on this Multi-wall Tuber for sewed valve bags. One to 6 walls. Machine built in 2 sizes, 20" and 25" face. Up to 5" gussets. Tubes 26" to 50" long. Improved cross pasting units, photo-electric compensating drives and flying splice paper roll stands can be furnished. If you have a bag problem write us.

THE SMITH & WINCHESTER
Manufacturing Company
South Windham, Conn.

SERVING THE PAPER INDUSTRY SINCE 1853

starting January 1, 1952.

Present conditions seem to indicate that users should buy only what they need, and not build up their inventories for over 30 to 45 days.

Coated book paper is slightly easier to obtain than is uncoated book; however, it does not now look as if either will present any problem for the early part of 1952.

A recent visitor from Scotland stated their book paper prices had increased eightfold since 1939, while our prices have about doubled—some difference!

Newsprint: T. A. Corcoran, *Courier-Journal and Louisville Times Co.*, Louisville, Ky.

In our previous newsprint report we said: *"For 10 months* this year, receipts have exceeded consumption by 174,000 tons." We should have said *"9 months,"* as the figures were available only through September at that time.

For 10 months, United States consumers have received 194,077 tons more than they have used. As a result, they have increased stocks from 592,475 tons at the start of the year to 786,552 tons at the end of October. The American Newspaper Publishers' Association estimates stocks as equivalent to 41 days' supply. This compares to 33 days' supply a year earlier.

Unfortunately, the increased supply has not been evenly distributed, and there are still some newspapers that are dangerously short of newsprint. NPA Regulation No. 1, as amended on October 22, brings paper under its inventory provisions. It is quite probable that this will tend to equalize the supply.

The long-term outlook brightened a little on November 21, when the Defense Production Administration ruled newsprint as essential item. This action gives this governmental agency's blessing to six projects that will eventually increase output in the United States by approximately 50 percent.

Included is the $50,000,000 mill projected for Charleston, Tenn., by the Bowater Paper Co. Sir Eric Bowater, president of the company, has previously issued a statement that "vested interests" were blocking his efforts to build the mill. Efforts to learn who the "vested interests" are were unsuccessful, but it is presumed that other paper mills who draw pulpwood from the same area may have opposed the location of the mill in East Tennessee.

Boxboard: Stuart T. Edgerton, *United States Rubber Company*, New York, N. Y.

The reports seem to indicate a plentiful supply of boxboard is available, that the raw materials required for the production of boxboard are in abundance and that the demand has been in a "down" position for several weeks. Some folks in the industry seem to think a pickup is in the making, but opinions are divided and the present situation may continue for several months.

There is no reason for any buyer to accept any quality board other than what he specifies. The abundance of raw materials is such that board manufacturers are able to make whatever quality is required.

The price situation is one of stagnation; if we were operating in a free market, the price of board would be very much lower. Due to the arbitrary controls which might be imposed, sellers are holding a price line which is hardly justified by market conditions.

Paper Containers: Lee R. Forker, *Quaker State Oil Refining Corporation*, Oil City, Pa.

At present, there is an ample supply of paper for the current container demand. It is reported that linerboard production is operating substantially lower than a year ago and inventories are increasing.

Producers are actively soliciting new business and supply appears adequate, as it is possible to secure without delay corrugated and solid fibre shipping cases, paper fibre drums, and multiwall paper bags.

It is reported that demand for certain types of paper containers has declined in some localities and for certain products, which permits other industries operating at peak capacity to secure a larger quantity of paper containers than normally.

Prices are reported firm, and quality is acceptable.

West Coast Conditions: Horace Duckenfield, *Metropolitan Life Insurance Co.*, San Francisco, Calif.

Generally speaking, supply has improved rather materially in most lines and demand has continued light. There have been a few price adjustments, some slightly downward.

Sulphite papers, bonds, ledgers, mimeo, duplicator and offset book continue to be tightest on supply. Other papers, especially the coated book pa-

The Controlled Flow
VICTORY BEATER
is manufactured by
THE NOBLE & WOOD MACHINE CO.
Paper Mill Machinery
Hoosick Falls • New York • U. S. A.

THE ACCEPTED STANDARD BRUSHES
Industrial BRUSHES
For All Paper Needs
Gus Riedel and Son
Manufacturers
KALAMAZOO, MICH.

DODGE
of Mishawaka, Ind.
FIRST IN POWER TRANSMISSION MACHINERY

GRINNELL
WHENEVER PIPING IS INVOLVED
Grinnell Company Inc., Providence, R. I.
Sales Offices and Warehouses in Principal Cities

THE RUST ENGINEERING COMPANY
Engineers and Constructors
Pittsburgh, Pennsylvania
Complete Service for
PULP AND PAPER MILLS—PLANTS AND FACILITIES
DESIGN, CONSTRUCTION, MODERNIZATION

for the manufacture of cellophane, rayon and paper products
RESTIGOUCHE COMPANY, LIMITED
Campbellton, New Brunswick, Canada

ALVIN H. JOHNSON & CO.
INCORPORATED
415 LEXINGTON AVENUE
NEW YORK (17), N. Y.
Consulting Engineers to The Paper Industry Since 1929

FRANK C. VAUGHAN
STUDIES, DESIGNS, ESTIMATES, CONSTRUCTION, MANAGEMENT AND EVALUATION for KRAFT, SEMI-CHEMICAL, PULP, PAPER AND STRUCTURAL BOARD MILLS
RICHMOND, VA.

pers and luxury paper, such as text covers and announcements, are very good. Wrapping paper, bags and tissue paper, generally, are very good. Boxboards, corrugated board and cartons are much easier to obtain than was true 60 days ago.

Conditions have eased up very materially, so much so, that buyers seem to be holding back to see if the future will be easier. Probably, however, they are being very watchful and, if there should be a tightening of supply, there will probably be a flurry of buying to protect against shortages.

It is generally thought that, after the first of the year, the effect of defense spending will be felt more, which may bring a demand that could overbalance the present supply.

Canadian Conditions: Newsprint is still fairly tight but all other papers are easing up.

The mills are trying to hold prices firm, while costs are still increasing. How long they can absorb these increases depends entirely on the production. If any slackness occurs and volume declines, prices will have to reflect the higher costs.

The demand for some paper products is declining and, unless this is of a temporary nature, paper stocks will be in good supply within the next few months.

The situation in Canada is vastly different from that of the United States. In the past, the Dominion has usually followed the trend of the American markets within 3 to 6 months. Present surpluses of paper in the United States will find their way into Canadian markets if prices are not too high. This will ease the situation in Canada and you will be able to get the paper you need.

However, do not be too confident, unless you have ample inventories. Paper supply can tighten up overnight and prices can still go up.

ASSOCIATIONS

(Continued from page 39)

2. "Corrosion Problems," by H. O. Teeple, International Nickel Co., New York, N. Y.
3. "Chemical Preparation and Liquor Recovery," by R. P. Whitney, Institute of Paper Chemistry, Appleton, Wis.
4. "Semichemical Pulping of New England Woods," by Daniel J. Adams, Bird & Son, E. Walpole, Mass.
5. "Some Notes on the Semichemical Process. Process Design and Equipment," by C. W. Converse, Sprout, Waldron Co., Muncy, Pa.

Corrugated Containers

1. Starch Adhesives Symposium.
2 Silicate Adhesives Symposium.

Alkaline Pulping

1. "Effect of Chip Size in Kraft Pulping," by W. J. Nolan and Wilson F. Brown, University of Florida, Gainesville, Fla.
2. "Studies in Continuous Alkaline Pulping II," "High Yield Cellulose Pulps from Scrub Oak," by W. J. Nolan and W. F. Brown.

Wax Testing

1. Symposium on Testing Methods.

Statistics

1. Papers to be announced.

Structural Fibrous Materials

1. Papers to be announced.

Paper Making (Special)

1. "Properties and Preparation of Paper Pulp for Paper Making," by James d'A Clark, Longview, Wash.

Miscellaneous

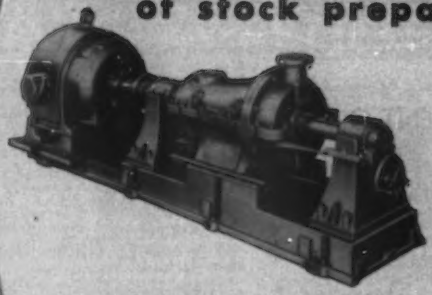
1. "Automatic Sheet Paper Counting," by Charles R. Stevens, Toledo, Ohio.
2. "Handling Materials in the Paper Industry," by L. O. Millard, Link Belt Co., Chicago, Ill.

Jones

Still

"the MIGHTY MITE"

of stock preparation



In mill after mill, the Jones High-Speed Refiner is being used as a highly versatile general utility unit . . . refining stock for high-quality ledger paper; defibering overissue news; clearing flakes from coated book broke.

And in case after case, the report comes back: "improved stock — better control — drastic reduction in operating horsepower requirements—lowered maintenance costs."

This explains why over 900 units have been sold (not counting those by imitators!) since its introduction. Your Jones representative will tell you more about it — or write for Bulletin 1011-B.

Jones

HIGH-SPEED REFINER

E. D. Jones and Sons Company, Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Nov. 17	Nov. 24	Dec. 1	Dec. 8	Dec. 15
1951	98.9	94.7	99.9	98.8r	97.1
	Nov. 18	Nov. 25	Dec. 2	Dec. 9	Dec. 16
1950	94.7	96.3	97.1	100.1	100.1

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	92.6	95.6	96.7	95.4	96.4	97.7	85.3	99.6	96.1	101.0	99.6	91.2	95.8
1951	99.3	101.3	101.9	102.8	102.2	100.1	88.6	97.7	94.8‡	100.8‡	98.4‡		

‡ Preliminary.
r Revised.

COMPARATIVE YEARLY SUMMARIES

	1944	1945	1946	1947	1948	1949	1950	1951
Year to Date	88.6	89.9	101.6	104.9	97.1	88.9	96.5	99.6
Year Average	88.1	89.4	101.1	104.3	96.2	88.6	95.8	

PAPERBOARD OPERATING RATIOS†

	Nov. 17	Nov. 24	Dec. 1	Dec. 8	Dec. 15
1951	86	75	80	86	86
	Nov. 18	Nov. 25	Dec. 2	Dec. 9	Dec. 16
1950	103	100	101	106	105

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Ave.
1950	88	92	91	92	91	94	82	100	96	102	101	95	94
1951	102	105	104	105	104	103	84	94	86	87	82		

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: The black line on the chart shows the ratio through December 1950 on the basis of 6-day capacity. Beginning with January 1950 the ratio is shown on the new basis of normal 6 and 7-day capacities by the colored line. Paperboard operating ratios continue on the basis of a 6-day week.

† Per cent of operation based on "inch-hours" reported to the National Paperboard Association.

GOVERNMENT GOSPEL

(Continued from page 16)

for 83 facilities for industrial inorganic chemicals output.

Plants for paper and related products approved number 82, and for alkalies and chlorides, 41.

Gumming IAC Regulations

Provisions of a proposed tailored regulation for their industry were discussed in detail by members of the Gumming Industry Advisory Committee on December 3 at their second meeting with OPS officials.

Prices to be spelled out would be on the following items:

1. Standard gummed kraft sealing tape, 30 inches wide, standard size rolls, 60 lbs. basic weight, 600 feet to the roll, per bundle; 16 to 499 bundles; 500 or more bundles.

2. Regular sisal tape in rolls, 1,000 one-inch yards, carload lots and less than carload lots.

It was proposed that the base prices be determined before the application of differentials covering different sizes of orders, terms of sale, freight, and differences in color, weight, finishes and other specifications.

OPS proposed that ceilings for gummed flat papers, veneer tapes, stay paper and gummed specialties be fixed at the individual manufacturer's highest prices as frozen under the General Ceiling Price Regulation, GCPR.

Committeemen objected that their increased costs were such that GCPR prices would not be satisfactory. They stressed the importance of the cost of adhesives as an element in their total costs.

OBITUARIES

Robert F. Engelhardt, 62, superintendent of United Board and Carton Corporation's Urbana, Ohio, papermill, died suddenly December 10, as a result of asphyxiation due to a faulty gas furnace in his hunting cabin in Michigan.

He was on a week-end hunting trip with Mr. R. Hunt, Monroe, Michigan, who was removed to a hospital in critical condition.

Mr. Engelhardt had been connected with the paperboard industry for many years, and had been recognized as one of the country's leading paper makers. He had been associated with United for 25 years.

In 1949 he was granted leave of absence to start a paperboard mill in Guatemala.

Mr. Engelhardt was a life time member of the American Pulp & Paper Mill Superintendent's Association. He was chairman of the New York-Canadian Division in 1941.

Surviving Mrs. Englehardt are his widow Pearl, and two children Robert, Jr. and Helen Margaret.

John D. Scott, 55, a former vice-president of the A. M. Collins Mfg. Company, Philadelphia, died suddenly at his home on the morning of December 15. He had been continuously associated with the company for more than 35 years.

Thomas Jefferson Klase of 9 English Village, Cranford, N. J., a retired traffic department executive of the International Paper Company of New York, died December 23 at his home of a heart attack.

Surviving are a brother, James L. Klase, and a sister, Miss Helen E. Klase.

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Barking Drums
Log Barkers
Bark Presses
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Digester Circulating Systems
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Blowsteam Condenser Plants

Turpentine Condensers
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MEN WANTED—POSITIONS OPEN

We can place—assistant manager of manufacturing for large pulp and paper mill, and converting dept.; asst. supts. for Cylinder board mills (2); personnel supervisor, large southern mill.

Chemists, chemical engineers and laboratory men, salary range $3600-$9000 year; mechanical, electrical, structural, instrument and plant engineers, designers and draftsmen; Aniline printing technician; salesmen for specialty papers, machinery and board products (several).

LIST YOUR CONFIDENTIAL APPLICATION WITH US to keep informed of attractive positions open in the pulp and paper mills.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston 8, Mass.

SPECIALISTS IN PLACING AND IN SUPPLYING PULP AND PAPER MILL EXECUTIVES D-28

MANAGER
For Paperboard Mill in Toronto, Canada Area
Essentials:
Must Be Technical Graduate
Good Character and Personality
With Ability To Handle Men
State
Age, Previous Experience And Accomplishments
Salary Expected And When Available
All Replies Held Strictly Confidential
Box No. 51-634 care Paper Trade Journal J-4

BACK TENDER AND BEATER ENGINEER—Must be thoroughly experienced in manufacture of high grade folding boards. Steady year round employment with progressive one machine mill. Applicants must outline experience and references in first letter. Miami Paper Board Mills, Inc., P.O. Box 187, International Airport, Miami 48, Florida. D-28

WANTED
PAPER MILL ENGINEER

Engineer-constructor firm has opening for Pulp and Paper Mill project engineer at Pittsburgh Headquarters. Must have 4 or more years experience in engineering department of a paper mill, or experience in pulp and paper mill design. In first letter submit complete resume of personal background, education, age, and experience. Write O. M. Rutledge, The Rust Engrg. Co., 575 Sixth Ave., Pittsburgh, Pa. J-11

WANTED—Master Mechanic or Assistant for modern 3-Machine Tissue Mill. Progressive management; expansion program now under way. Fine opportunity for young/middle aged man to advance. Substantial paper mill mechanical experience with electrical background desirable. Give complete resume of experience in letter to Box 51-442 care Paper Trade Journal. Replies held strictly confidential. TF

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118 State St., Springfield 2, Mass.
Personnel Consultants
Confidential Placement Service for Employers and Employees in the Pulp and Paper Industries and Allied Trades. Executive-Administrative Sales Office
Correspondence Invited. D-28

SALARIED POSITIONS $3,500 to $15,000. We offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. E. W. BIXBY, INC. —117 Dun Bldg., Buffalo, 2, N. Y. TF

WANTED—Adjuster on S.O.S. Potdevin Grocery Bag Machines. Top wages. Confidential. Address Box 51-618 care Paper Trade Journal. J-4

WANTED—One Tour Foreman for sulphite pulp mill located in Western Massachusetts. Salary according to ability. Address Box 51-633 care Paper Trade Journal. J-18

POWER PLANT ENGINEER WANTED to take complete charge of power department. Address Box 51-635 care Paper Trade Journal. J-25

WANTED — Machine Tenders and Back Tenders for corrugating medium and liner mill. Fourdrinier and cylinder machines. Located in Western Pennsylvania; good working conditions; pleasant surroundings and very good labor relations. Call collect—Tarentum 1470. TARENTUM PRODUCTS CORPORATION, Tarentum, Pa. TF

TOUR BOSS—Shift Work—High speed newsprint experience essential. Two machine modern mill, excellent working conditions. Give complete resume. Write Box 51-611 care Paper Trade Journal. D-28

WORKING SUPERINTENDENT for small fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 51-596 care Paper Trade Journal. TF

SITUATIONS WANTED

SUPERINTENDENT — Thoroughly experienced papermaker desires to make new connections. Conventional or Yankee Fourdriniers, light and heavyweight specialties. References. Address Box 51-487 care Paper Trade Journal. D-28

EXPERIENCED Paper and Board Mill Superintendent with equipment sales experience, seeks new connection operating small mill, or selling position. Available January 1st. Address Box 51-613 care Paper Trade Journal. D-28

SUPERINTENDENT desires change. Thoroughly experienced in finishing and converting—highly successful in production—good labor relations. A-1 references. Address Box 51-636 care Paper Trade Journal. J-11

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SUPERINTENDENT AVAILABLE — 30 years experience in manufacture of lightweight tissues, toilet, facial, napkin, toweling, twisting, waxing, wrapping, etc. Cylinders and Fourdriniers. Desire position in smaller mill where low cost operation is a must and where superintendent must handle maintenance and papermaking from boiler room to shipping platforms. Prefer to locate near N. Y. Address Box 51-632 care Paper Trade Journal. D-28

FOR SALE

FOR SALE

4—48" x 152" dryers with gears and bearings, new 1944
2—Vertical General Electric motors, 125 HP, 550 volt, sixty cycle, three phase
2—Jones pulpers with reducers
30—Dryers 48" x 46", chromium plated with gears and bearings
1—24" x 120" extractor roll
2—10½" x 170" suction felt rolls
1—18" x 104" suction press roll
1—New Westinghouse five unit drive for 80" machine
1—150 HP Westinghouse steam turbine and gear reducer unit, new 1944

Frank H. Davis Company, 175 Richdale Avenue, Cambridge, Massachusetts. D-28

FOR SALE—52" Cameron type 8 Model 3 Slitter; 48"Kidder Model CH shear cut slitter; 76" Cameron Rewinder; 75" Moore & White Upright 2 drum Reel; 42" Moore & White Sheeter; 100" Dillon Sheeter. Thomas W. Hall Company, Inc., 120 West 42nd St., New York, 18. TF

FOR SALE—7 Steam heated paper or textile drying drums. 36" diameter. 4 are 44" and 3 are 46½" face. Completely reconditioned with new ball bearing pillow blocks, rotary steam unions and flexible metal steam hose. Write for details: P. O. Box 7, Chatham, N. J. J-4

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon, Laboratory Coating and Treating and Flat Reel Measuring and Converting Machines. New improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11, N. Y. TF

FOR SALE—Cameron 62" Slitter and Reel winder; 6" x 7" Brightwoods and Inman Roll Feed Auto. Box Machines. COMPLETE SET-UP BOX MFG'R. PLANT SELLING OUT OVER 50 MACHINES. Bargains, write for listings. Address Box 51-626 care Paper Trade Journal. TF

FOR SALE—49" Wolverine two-color Aniline Printing Press, less than year old. (Provision for four colors). Owner giving up private plant. Address Box 51-632 care Paper Trade Journal. J-4

FOR SALE—Cameron Slitter Model 42" type 26-2A Rewind Drive. Used ten hours. Complete with knives, extra mill roll, etc. Reasonable for quick sale. The Booth Felt Company, 463-19th Street, Brooklyn, 15, N. Y. Phone SOuth 8-6670. D-28

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1—Sandusky Couch Roll—126" drilled face x 22" diameter.
1—123" 3 bowl revolving reel.

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72—Top and bottom Dryer Bearings 7" diameter x 12" long.

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1—Dilts Iron Tub Laboratory Beater. Beater roll 14" diameter x 10½" face.

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1—9 roll 68" Calender Stack.
1—72" 4 roll calender stack. (Extra heavy duty).
1—84" Smoothing Calender Stack, 2 Iron Rolls, 2 Cotton Rolls.
1—60" 3 roll friction calender stack. All iron rolls.

CHEST
1—Cast Iron Stock Chest, 25' long x 8' high. (With agitator).

CHIPPER
1—36" Murray 4 knife Chipper—anti-friction bearings.

CLASSIFINER
1—Dilts Classifiner, practically new, with motor.

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.
1—Jeffrey Hammermill.

CYLINDER MOLDS
2—30" diameter x 72" face.
1—36" diameter x 79" face.
1—36" diameter x 54" face.
1—36" diameter x 96" face.
1—42" diameter x 72" face.
1—30" diameter x 92" face.
1—30" diameter x 72" face.
1—42" diameter x 120" face.

DRIVES
1—Jones Reducer 75 h.p.—30.8 to 1.
1—#6½ Reeves Drive.
1—#24 Reeves Drive
1—Reliance Electric Drive, complete with 3 gear head motors.
1—#3 Reeves Drive (totally enclosed).

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1—Complete unit, consisting of 6 dryers, 36" diameter x 38" face, including frames, gears, anti-friction bearings.
7—24" diameter x 48" face.
1—36" diameter x 143" face.
1—48" diameter x 70" face.
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2—28" diameter x 48" face.
8—24" diameter x 60" face. frames.
1—20" diameter x 61" face, complete with
1—12" diameter x 60" face.
1—60" diameter x 66" face.
1—84" diameter x 48" face.

FLAT SCREENS
1—6 plate Shartle Flat Screen.
2—Packer, 12 plate, roller shoe type.
1—6 plate Sandy Hill (Packer).

FOURDRINIER PARTS FOR 134" MACHINE
6—Suction Boxes, 34 table rolls, Brass Slide Rails.

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1—60" Cutter.

JORDANS
1—Horne Jordan.
4—Noble & Wood Mammoth.

LIME SLUDGE FILTERS
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MOTORS
Write us regarding your requirements.

PRESSES
3—Sets Primary Presses, complete, 148" face. Anti-friction bearings. Also all types of rolls for 148" wet end.

PULLEYS
Various cone and assorted pulleys.

PULPERS
1—Jones Pulper. Complete with motor and drive.
1—Noble & Wood Pulper—Iron Tub.
1—Lannoye Pulper.

PUMPS
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.
4—Shartle Brothers circulating pumps, each 4,000 g.p.m.

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1—123"—3 bowl Revolving Reel.
1—72" Dowingtown Reel, 2 bowl.

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2—#1 Claflin Refiners.

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Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

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1—#2 Bird Rotary Screen.

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1—#5 Bird Saveall.
2—Savealls, 36" diameter x 136" face cylinder molds, iron end vats.

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1—65" Clark Sheeter, 8 roll backstand.

SHREDDERS
3—Daniels Rag Cutters.

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1—112" 2 drum Waldron
2—112" Cameron—Type 18.
1—104" Beloit two drum winder.
1—92" Moore & White 4 drum winder.
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1—62" Cameron—Type 26-3A.
1—62" Cameron—Type 8-10.
1—60" Langston (Shear cut).
1—52" Cameron—Type 8-5.
1—42" Cameron Constant Tension with pneumatic control.
1—62" Cameron—Type 10.
1—72" Cameron—Type 8-10.
1—72" Cameron—Type 10.
2—42" Cameron Type 40-1-AF

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1—10 x 20 Shartle Dupex.
1—7 x 16 Shartle Duplex.
2—10 x 10 Beloit Duplex, low type, with motors.
Advise us to your requirements.

SUCTION COUCH ROLL
1—Sandusky Couch Roll 126" drilled face x 22" diameter

SUCTION BOXES
5—136" face Suction Boxes.
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34—5" diameter x 138" face.

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2—72" Hudson-Sharp (Surface type winder).

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1—L-4 Nash Vacuum Pump.
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WET MACHINE
1—72".

YANKEE DRYERS
1—48" Face x 84" Diameter, Frames & Bearings.
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1—64" face x 60" diameter, including frames and bearings, also 2 dryers 20" diameter x 64" face.

We are always in the market to purchase your surplus or idle machinery. What have you to offer? Wanted Cylinder and Fourdrinier Machines (complete mills).

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50,000 cords of Exportable rough, Jack Pine pulpwood for delivery at the rate of 15,000 cords per year commencing June, 1953. Pineland Timber Company, Limited, P. O. Box 126—Sudbury, Ontario. D-28

PAPER MILL FOR SALE OR LEASE

Two machine Cylinder Tissue mill suitable for Twisting, Waxing or Wrapping grades. New York State location. Address Box 51-640, care Paper Trade Journal. J-18

WANTED

WANTED—50" Paper Power Cutter. Must be inexpensive. Address Box 51-612 care Paper Trade Journal. D-28

WANTED

WANTED TO BUY

1 44 or 50" Seybold 10-Z-Trimmer. Must be in good operating condition. Address Box 51-638 care Paper Trade Journal. J-11

WANTED

Good Used Rotary Sheeter with slitting attachment layboy and backstands to handle rolls maximum width 90". Address Box 51-631 care Paper Trade Journal. D-28

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 51-89 care Paper Trade Journal. TF

WANTED

WANTED

84" wide Power Paper Cutter of any standard make. Address Box 51-629 care Paper Trade Journal. D-28

WANTED

60" to 84" Seven to Nine Roll Stack of Super Calenders. Address Box 51-630 care Paper Trade Journal. D-28

MACHINERY WANTED — Bag Machine — maximum range 22" x 32". Give full details. Address Box 51-624 care Paper Trade Journal. D-28

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DURO —our standard returnable paper mill core of plus-standard quality.

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Operates on the Only Correct Principle of Freeness Testing.
Automatic Timing with Electric Stop Clock which Measures Drainage Rate through a Wire, same as on Paper Machine.

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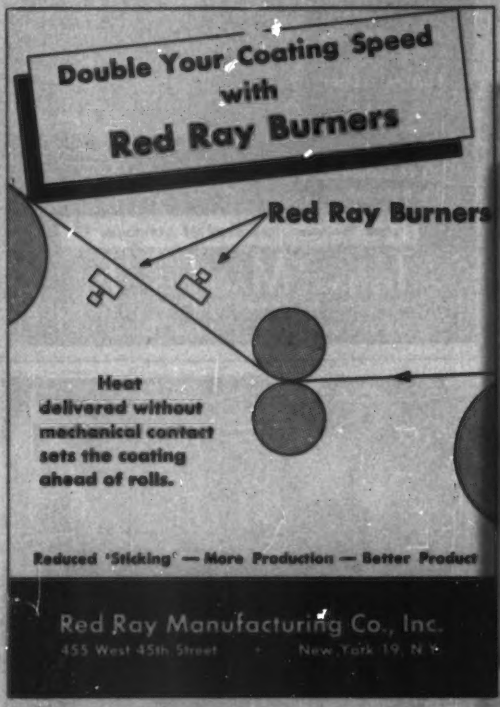

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This 3 in 1 laboratory "assistant" is simple to operate, quick and accurate, and a real utility instrument where printing quality of paper must be reliably measured.

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The Noble & Wood Machine Co.
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Dilts Machine Works
E. D. Jones & Sons Co.
The Moore & White Co.
Shartle Brothers Machine Co.
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BASIC WEIGHT SCALES
Thwing-Albert Instrument Co.

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Black Clawson Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
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Shartle Brothers Machine Co.
SKF Industries
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The Appleton Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Morden Machines Co.
The Noble & Wood Machine Co.
J. J. Ross Company
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Lukenweld Div., Lukens Steel Co.
The Noble & Wood Machine Co.
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Shartle Brothers Machine Co.
Valley Iron Works Co.

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Carthage Machine Co.
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BRUSHES
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The Sandy Hill Iron & Brass Works
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Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell United Co.
Edward J. McBride
The Moore & White Co.
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Rice Barton Corporation
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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

CARRIER ROPE
Williams-Gray Co.

CASEIN
American Cyanamid Co.
Industrial Chems. Div.
Bunge Pulp & Paper Co.
Hercules Powder Co.

CASTINGS
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Babcock & Wilcox Co.
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblett Machine Co.
Lobdell United Co.
Magnus Metal Corp.
Michigan Steel Casting Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.

Nichols Engrg. & Research Corp.
Rose, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CHAINS
Jeffrey Mfg. Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICALS
American Cyanamid Co., Industrial Chem. Div.
Bauge Pulp & Paper Co.
Calco Chemical Co.
Calgon, Inc.
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuffs Corp.
Geigy Co., Inc.
B. F. Goodrich Chemical Co.
Gottesman & Co.
Hercules Powder Co.
Heyden Chemical Corp.
Hooker Electrochemical Co.
The Kinsley Chemical Company
Monsanto Chemical Company
National Aluminate Corp.
Naugatuck Chemical Division of U. S. Rubber Co.
Niagara Alkali Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Reichhold Chemicals, Inc.
Rohm & Haas Co.
Virginia Smelting Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

CHESTS
The Bagley & Sewall Company
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Noble & Wood Machine Co.
Shartle Bros. Mch. Co.

CHIP PACKERS
Fibre Making Processes, Inc.

CLEANING MATERIALS
American Cyanamid Company Industrial Chemicals Division
Diamond Alkali Co.
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Farrel-Birmingham Co.
Hudson-Sharp Mch. Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Stephens-Adamson Mfg. Co.

COATING MACHINERY
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
The Mayer Machine Co., Inc.
Moore & White Co.
Potdevin Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc.

COATING MATERIALS
American Cyanamid Company Industrial Chemicals Division
The Dow Chemical Co.
E. I. du Pont de Nemours & Co., Inc.
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division, Libbey-Owens-Ford Glass Co.
Reichhold Chemicals, Inc.
Wyandotte Chemicals Corp., Michigan Alkali Div.

COMPLETE FOURDRINIER ROLL GRINDING
Manchester Machine Co.

COMPRESSORS
Allis-Chalmers Mfg. Co.
Nash Engineering Co.
Roots-Connersville Blower Corp.

CONDENSATE FILTERS
Hungerford & Terry, Inc.
The Permutit Company

CONDENSERS
Fibre Making Processes, Inc.

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Bird Machine Company
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Paper & Industrial Appliances

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Dilts Machine Works
Ebasco Services
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Main, Inc., Chas. T.
The Rust Engrg. Co.
Shartle Bros. Mch. Co.
J. E. Sirrine & Co.
Frank C. Vaughan
John Waldron Corp.

CONTINUOUS DIGESTER
Paper & Industrial Appliances

CONTROLLERS
Black Clawson Company
The Brown Instrument Co.

CONTROLS
The Brown Instrument Co.
Johnson Corp.
Foxboro Control Co.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

CONVERTING MACHINERY
The Bagley & Sewall Company
Egan, Frank W., & Co.
John Waldron Corp.
Dilts Machine Works

CONVEYORS
Black Clawson Company
Jeffrey Mfg. Co.
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.
Shartle Brothers Mch. Co.

CORES
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Smith & Winchester Mfg. Co.
Sonoco Products Co.

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Alpha Cellulose Corp.
Hercules Powder Co., Inc.
Railway Supply & Mfg. Co.

COTTON PULP
Alpha Cellulose Corp.

COUCH ROLLS
Beloit Iron Works

COUPLINGS
The Bagley & Sewall Company
Black Clawson Company
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John

CRANES
Whiting Corp.

CURL TESTER
Thwing-Albert Instrument Co.

CUTTERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Gibbs-Brower Company, Inc.
Graphic Arts International Corp.
Thomas W. Hall Co.
Jagenberg-Werke Akt. Ges.
Moore & White Co.
Perkins & Son, Inc., B. F.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.
Taylor, Stiles & Co.

CYLINDER MOULDS
Manchester Machine Co.
Rice Barton Corporation

CYLINDERS
M. W. Jenkins Sons, Inc.

DAMPENERS
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General Dyestuff Corp.
Kinsley Chemical Co.
Nopco Chemical Co.

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The Permutit Company

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General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

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Blaw Knox Company
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Lukenweld
Nash & Industrial Appliances
Posey & Jones Corp.

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General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Lodding Engineering Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

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Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.

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Lukenweld
The Moore & White Co.
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J. J. Ross Company
Reed-Ray Mfg. Co., Inc.
Rice Barton Corporation
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

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Farrel-Birmingham Co.
Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Valley Iron Works Co.

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DRYER ROLL PYROMETER
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Moore & White Co.
D. J. Murray Mfg. Co
John Waldron Corp.

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Bunge Pulp & Paper Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
National Aniline Division, Allied Chemical & Dye Corp.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

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Egan, Frank W., & Co.
John Waldron Corp.

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Wyandotte Chemicals Corp.

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Rohm & Haas Co.
Vanderbilt Co., R. T.

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Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

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Ross Engineering Co., J. O.

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The Permutit Company
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Waldron Corp., John

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Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Holyoke Machine Co.
J. M. Huber Corp.
Hungerford & Terry, Inc.
Johnson Corp.
Moore & White Co.
J. O. Ross Engrg. Corp.
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Walworth Company

FITTINGS
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Crane Company
Shartle Bros. Mch. Co.
Walworth Company

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The Moore & White Co.
Noble & Wood Machine Co.
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Shartle Brothers Machine Co.

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Rice Barton Corporation
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Streh Process Steel Co.
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GRAVITY FILTERS
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GRINDERS
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Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell United Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company
Simonds Abrasive Co.

GUIDES
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Egan, Frank W., & Co.
Gilbert & Wash Co.
The Moore & White Co.
Mount Hope Machinery Co.
Rice Barton Corporation
John Waldron Corp.

GUMMING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
The Sandy Hill Iron & Brass Works
Waldron, John, Corp.

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National Starch Products, Inc.
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E. D. Jones & Sons Co.
General Electric Co.
D. J. Murray Mfg. Co.
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Ross Engineering Corp., J. O.
Valley Iron Works Co.
Ross, J. O., Engrg. Corp.

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Aktivin Division, Heyden Chemical Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

IMPREGNANTS
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B. F. Goodrich Chemical Co.

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Beloit Iron Works
Johnson Corp.
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Rice Barton Corporation
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Shartle Bros. Mch. Co.
Smith & Winchester Mfg. Co.
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KNIVES
Black Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
The Moore & White Co.
The Noble & Wood Machine Co.
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KNOTTERS
Fibre Making Processes, Inc.

LABORATORY CORRUGATOR
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Bauer Brothers Co.
Bird Machine Company
Dilts Machine Works
W. & L. E. Gurley
Egan, Frank W., & Co.
E. D. Jones & Sons Co.
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.
John Waldron Corp.
Williams Apparatus Co., Inc.

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Dilts Machine Works
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Bagley & Sewall Co.
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Downingtown Mfg. Co.
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Hudson Sharp Machine Co.
Jagenberg-Werke Akt. Ges.
Langston Co., Samuel M.

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PARAFFIN WAX EMULSIONS
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Black Clawson Company
Dilts Machine Wks.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

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Crane Company
Grinnell Company
Michigan Steel Casting Co.
National Tube Co.
Walworth Company

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Armco Drainage & Metal Products, Inc.
Crane Company
Grinnell Company
Michigan Steel Casting Co.
Walworth Co.

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General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.

PLASTICIZERS
American Cyanamid Company, Industrial Chemicals Division
Aktivin Division, Heyden Chemical Corp.
B. F. Goodrich Chemical Co.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
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Babcock & Wilcox Co.
J. O. Ross Engrg. Corp.
Lukenweld Division
Lukens Steel Company
Timken Roller Bearing Co.

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Black Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

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PRESSURE VESSELS
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.

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Black Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Mch. Co.
The Moore & White Co.
Potdevin Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

PULLEY
Lovejoy Flexible Coupling Co.
Rice Barton Corporation

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Thwing-Albert Instrument Co.

PULP CLEANERS
Nichols Engrg. & Research Corp.

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Record Pdy. & Mach. Co.
Shartle Brothers Machine Co.

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Bauer Brothers Co.
Dilts Machine Works
E. D. Jones & Sons Co.
Morden Machines Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

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V

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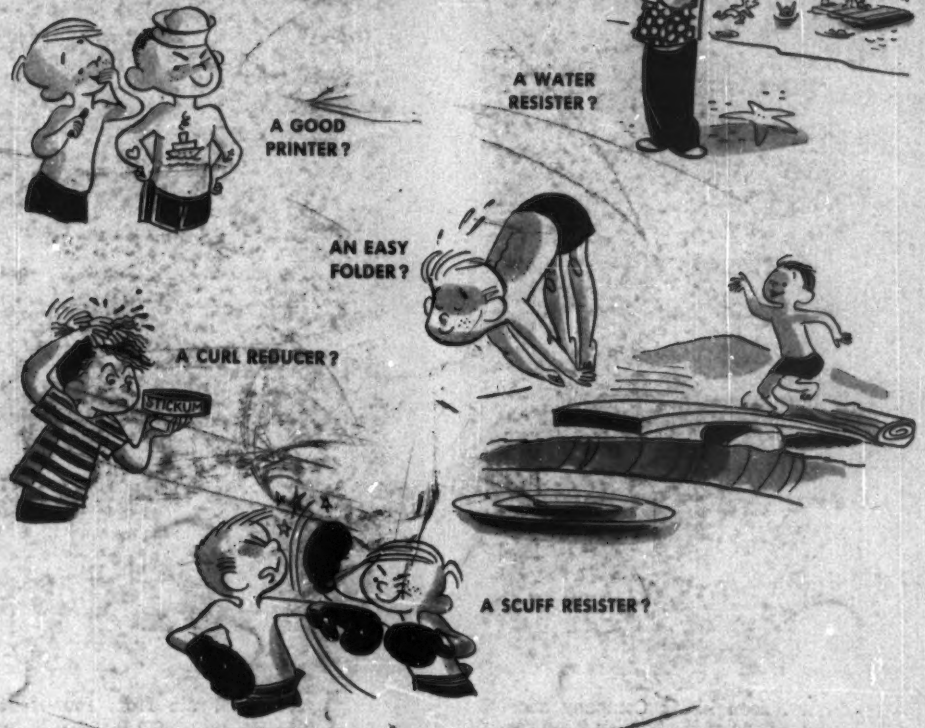

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